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Some Recent Discoveries on the Art of the Etruscans.

THERE must be few of the reading public who have not been charmed this season with the work of one of our popular novelists, the scene of which is laid in the all but deserted Maremma. The portion of Italy which lies between Leghorn and Civita Vecchia has always possessed something more than an ordinary interest for the traveller and the archæologist. The melancholy and fever-stricken Maremma, and the neighbourhood of the classic Lake Trasimene, have long been regarded by the antiquary as a prolific field for research; and it scarcely required the imagination of the romancist's art to add in any degree to the interest that attaches to that portion of Italy known as Etruria. But in spite of the innumerable relics which we possess of the civilisation of the Etruscans, notwithstanding the wealth of every European museum in Etruscan antiquities,* research has been singularly baffled for the three centuries that the great necropolis of Central Italy has continued to supply its yield of archæological treasure. We have learned more of late years of Egypt, Assyria, Chaldæa, Asia, America, and the pre-historic races than of the story of the early inhabitants of the classic peninsula with which we have for generations past been made familiar. So little, indeed, has been discovered concerning the Etruscans and their tombs with the quaintly smiling figures filling case after case in our great museums, that there are not wanting those who urge the uselessness of further research in this direction. But fortunately archæologists are a happy race, not to be deterred by ill success from the prosecution of their studies. In the research which has now for so many generations been carried on to acquire some definite information respecting the Etruscans, fortune may be said finally to have blessed the efforts of the antiquaries.

Etruria, till the days of "the iron way" a difficult and even dangerous portion of the country to penetrate, is now comparatively easy of access. But though modern activity has facilitated the approach to the Maremma, the district still remains, fortunately, almost as little invaded by the omnipresent modern traveller, as it was in the days when Dennis wrote his fascinating and familiar volumes. And yet the district possesses an interest more than common. This interest may be said especially to centre round Corneto, where within the last few months a series of excavations has brought to light some most invaluable relics of the past civilisation of Etruria.

Corneto is a small town situated between Orbetello and Civita Vecchia. It is now easy of access, thanks to the railroad, and the interest of the visit at this season of the year, when the swallows are preparing to flit southwards, will well repay any fatigue. Opposite Corneto lies the site of Tarquinii, one of the largest and most important cities of Etruria, at a time when the Maremma, now a fever-stricken tract, was a habitable, well-cultivated district the Etruscans had skilfully reclaimed from the state to which their descendants have again, through their neglect, allowed it to degenerate. Corneto, which to the lover of mediæval and Renaissance art offers not a few elements of study,* owes, however, its chief interest to its Etruscan antiquities, and this the municipality have with wisdom understood.

The Etruscan tombs which have been the scene of the recent excavations,—the result of which it is our intention to lay before our readers,—lie scattered over the very hill on which Corneto is built, it having been the necropolis of Tarquinii. It is beyond the limits at our disposal to enter into any lengthy description of these interesting Etruscan remains, which have been the subject of a very long and learned paper recently published in the pages of the *Revue des Deux Mondes* by the well-known archæologist, M. Gaston Boissier. We shall simply endeavour to summarise as briefly as possible the contents of this article with a view to placing before our readers the chief results of the recent discoveries made in the tombs at Corneto respecting the mysterious art of the Etruscans. It is to the labours of the eminent scholar, Herr Helbig (whose connexion with the German Archæological Institute of Rome has long rendered his name familiar to readers), that we are chiefly indebted for the fund of information now at our disposal, and his careful research among the tombs at Corneto has, we think it will be seen, enabled him to most satisfactorily solve many very involved and intricate points respecting what has so far appeared puzzling in the art and civilisation of the Etruscans.

What especially increases the interest of these tombs,—a description of the art represented in which would lead us beyond our limits,—is the fact that they form our chief and only trustworthy source of information respecting the Etruscans, their language having remained as yet an enigma to the archæologists. Problems apparently far more difficult to solve have been satisfactorily dealt with; the inscriptions of Egypt and Assyria we now read with comparative facility; those of the Etruscans remain as yet a dead letter to us, yet their language was one spoken till the time of the Roman Empire; the inscriptions in our possession are numerous, and consisting mostly of epitaphs, might be, it would be supposed, easily understood; but each student interprets their meaning differently. After a century of study we are no further advanced than when Lanzi (1789) published his *Saggio di Lingua Etrusca*. The promising labours of Corssen* were only very recently interrupted by his death; the archæologists, in fact, have been so far fairly baffled in their researches respecting the Etruscans. Their language remaining for the present unreadable, we have no other means of judging of their life than through their tombs and the art they display. As yet, even a definite chronology has not been established. The monuments of Etruria being in almost every case imitations of foreign examples, it is alone by comparing them with those of Egypt, of Assyria, and of Greece that it is possible to assign them to any school or any date. Those who prosecute the inquiry must, therefore, be familiar with the whole known art of antiquity.

Among the tombs, the oldest, it is true, are easily distinguished. This year the excavations pursued at Corneto have brought to light a number of tombs of evident antiquity. These are mostly simply composed of a round hole some 5 ft. broad, and 6 ft. to 9 ft. deep, an urn containing the ashes of the dead being placed at the bottom of each. About the urn are arranged the different objects which the piety of the survivors desired to preserve, such as bracelets and fibulæ of bronze, in some cases hand-made vases of greyish black clay, decorated (when not entirely plain) with a purely geometrical incised pattern; such vases most of the European museums have long possessed, and their interest lies chiefly in their proving the early existence of that desire for decoration, for the superfluous, in fact, which marks the first stages of civilisation, the growth of the germs of a brilliant future art. In these antique tombs neither gold nor iron is to be found. In what are known as the *terremare* of Northern Italy have been discovered among the remains of villages built on piles and belonging to the bronze age, vases strikingly resembling those recently found at Corneto, and evidently belonging to a civilisation only one degree or so behind that of archaic Etruria. The archæologists may, therefore, now be said to be in possession of the elements of the entire progres-

* The new Etruscan Room in the British Museum has received in these pages a lengthy notice.—See *Builder*, vol. xli., p. 623.

* The superb Palazzo Vitelleschi, and the interesting Church of Sta. Maria in Castello, untouched in its twelfth-century simplicity, are both remarkable works.

* Corssen published in 1876 "Beitrage zur italischen Sprach kunde." His work, "Ueber die Sprache der Etrusker," illustrated, appeared in 1874-75.

sive civilisation of Italy, from its earliest productions down to what we all understand as classic times. One point is worthy of attention; archæological research has brought to light in almost every portion of the Italian peninsula similar relics, a fact which would go far to show that there existed in these primitive days a greater and more widespread degree of civilisation than is generally believed; this civilisation, however, we find very unequally distributed. Italy, when it was conquered by the Romans, did not become entirely Roman. In the midst of the general culture there still remained some isolated spots of barbarism. History is unable to point to these, and here it is that archæology steps in to reveal their existence. As an instance, recent excavations made at Este have unearthed works of art which, though known (from the presence of a coin) to be of the Augustan age, might easily be mistaken for the work of two or three centuries earlier.

Etruria, however, rapidly developed an advanced civilisation. Tarquinii especially, situated as it was near the sea-coast, received at an early date the visits of merchants and traders from the East. A curious tomb, discovered only last January, singularly proves this fact; in this tomb, that of a young girl buried with all her jewelry about her, were brought to light, among a number of pieces of bronze and goldsmith's work, several pieces of amber. The presence of these evidences of refinement represents a first step on the road of luxury which we see later on leading to a high degree of elegance.

The period which follows presents a marked progress. For the first time we meet with those beautiful black vases termed by the Italians *vasi di bucchero nero*; in the early periods smooth, and then ornamented with reliefs. Later on these vases, then doubtless deemed the perfection of the potter's art, we see ridiculed by the Romans as "old black pottery," which it required Martial's satire to recall to his countrymen had, however, once served the great king Porsenna. The tombs containing these vases have yielded numerous other objects, scarabæi in *pietra dura*, delicate jewelry, and, above all, perfume-vases strangely decorated with chimerical figures of a markedly Assyrian type. Beyond question, these vases are of Oriental origin, and how they reached Italy modern research has come forward to explain by the commercial activity of the Phœnicians. Recent authorities lean to the supposition that these Phœnician objects came from the colony of Carthage, and hence a definite date can at length be arrived at. Herr Helbig traces back the Phœnician trade to about the seventh century before the Christian era. With the sixth century, while Rome was still unimportant, the trade between Carthage and Italy was most active, and to this period we may attribute the large importation of Oriental objects found in the tombs of Italy.*

This point settled, a great advance is made in our acquaintance with Etruscan civilisation, the presence in which of elements, evidently Oriental, has long puzzled the archæologists. But the influence of Asia on the art and industry of the Etruscans has in no way any connexion with their origin. We continue to remain in doubt on this point, but the problem is relieved of one difficulty, and is thus brought nearer a definite solution.

Free Library at Twickenham.—Twickenham has set a good example to other and more considerable places by the adoption of the Free Libraries Act. Its Free Library was opened to the public on Monday morning, without ceremony, at the Town-hall, the owner of which, Sir Charles Freake, has generously placed a suite of rooms at the disposal of the committee until their funds will admit of the erection of a permanent free library building. This is only one of many ways in which Sir Charles Freake has sought to benefit the town. We trust that means will soon be forthcoming for the erection of the permanent home of the library.

* M. François Lenormant (whose position as an archæologist is well known in this country) is inclined, while thoroughly accepting the theory of Herr Helbig, to urge a certain share of credit to the Greeks, who also imitated the products of Egypt and Assyria; and this view the eminent antiquary has been able to support by the evidence of several vases discovered by him at Vulci and Cervetri.

A GERMAN CRITIC ON ENGLISH ARCHITECTURE.

An observant German critic, whose account of the progress of the minor arts in England we reproduced in a recent number, has now given his impressions of the state of architecture in this country. In this art, which, according to the opinions of some of the greatest thinkers, is the root of all the other plastic arts, there is, according to Herr Zimmern, undoubtedly a very lively interest taken in England. At the present moment the art of house-building amongst us is in a transition stage. Like all the other arts subservient to the wants of ordinary life, this department of architecture has, of late, undergone a remarkable change. As in many other cases, the change has taken the form of a revival of older models. It has led to a good deal of national self-condemnation, to the disparagement of everything modern, and laudation of the distant past, whose best productions are still preserved while the less valuable have disappeared. How far the present state of things merits the disdain shown by one party or the praise passed upon it by another school, is a question open to debate. But all critics are agreed that the condition of affairs which immediately preceded the present was about as bad as possible. The worst of it was that men were blissfully in the dark as to their own ignorance. There was a time when Englishmen were quite content that row after row of stucco-covered houses should be built of undeviating similarity, all being alike unbeautiful, both as regards design and materials. The iron railings in front of these houses were all after the same pattern. Street after street arose upon the same monotonous model in all the towns of England. Nor were their architects and builders awakened either by their own feeling or by the voice of their neighbours to the consciousness that there was any imperfection in their work. On the contrary, while, for instance, Gower-street has now become proverbial for its stiff uniformity or monotony, there is a topographical history of London belonging to the days when Gower-street was built which speaks with delight of its majesty and beauty, and of the honour it reflected upon its noble proprietor. And from that period,—that is, the earliest years of the present century,—things have been constantly going downhill.

The small houses of the suburbs of London are almost without exception very ordinary and common as regards design. They are, as regards material, cheap almost to worthlessness, and dishonest in construction. Where there are ornaments they are faulty and insignificant.

Fortunately, however, the time has come when we are no longer content with this state of things. Englishmen have arrived at the perception that the new parts of a town have no need to be ugly as a matter of course. They have seen that ancient houses, even in towns, present forms that are not so wearisome to the eye. They have begun vehemently to condemn the men who covered the land with long rows of villas, shops, and residences, all destitute of variety. English architects looked round and glanced backwards. They observed that the ancestors of Englishmen had built solid red brick walls and pointed roofs, a style in which there are many country houses still existing,—and they commenced to design occasional houses after this model. Thus for some time past new country houses and suburban villas have mostly been built of brick without stucco. Gables, dormer windows, and turrets have been becoming by degrees more frequent. At various points there are small projecting balconies, and deep portals have taken the place of the simple house doors.

This favourite style of building, which is named after Queen Anne, was at first revived for detached houses, and then for groups of single and semidetached villas. It was a long time before the style gained ground in the uniform rows of houses in London streets or squares; but finally a well-known architect, instead of the ordinary dirty-brown rectangular boxes of Bloomsbury-square, had built for himself there a house in common unstuccoed brick, with the deep portal, the pointed roof, and the broad windows of the above-mentioned style, for whose spread this master has done so much in other districts. The house is not, perhaps, one of his happiest efforts; yet it forms so pleasant a break in the monotony of the square in question that every one who has frequently to pass there cannot but be sincerely grateful for it. In Kensington there soon arose one red-brick house after another, with numerous projecting corners, points, and gables. Such a house is noticeable in the Exhibition-road, South Kensington. It is distinguished by a niche in the external wall, in which stands a blue porcelain ewer, an unusual ornament, which produces a most pleasant effect in the way of colour. In Hampstead, a district which has always been a favourite one with lovers of art, the Queen Anne style has become the predominant one, and there some of the finest buildings of this description are to be found. A new street, called Fitz-John's-avenue, is inhabited mostly by artists, and the new houses, many of which are not yet completed, form typical examples of the moderu English style of building. There we see clearly manifested how much the appearance of a street gains by variety. Hardly two houses are to be seen there alike, except in the case of the semi-detached or double villas. They are all different in design and colour, but the materials employed are in almost every case brick, while the designs are mostly widely different from the square box-like form that once satisfied us. Although these houses are still new, and have the naked and rather glaring appearance which is almost unavoidable in the case of new houses, they nevertheless present even now a perspective which charms and delights the eye. By this it is not intended to assert that every house in Fitz-John-avenue is satisfactory in architectonic respects. But the effect upon the whole is refreshing, the colour of the roofs in particular has this effect. They are mostly covered with tiles, instead of slate, and these quite surprise the ordinary Londoner, who is accustomed to walk about the long grey streets without knowing why they produce such a gloomy effect. He has no experience of the fact that a row of houses may present agreeable colours.

A short distance from London, in Bedford Park, Turnham Green, the Queen Anne style has attained a remarkable degree of development. There, a gentleman, owner of some hundred acres in that district, conceived some years ago the idea of covering the entire estate with houses of this description. He believed that the dearness of such buildings at that time was ascribable to their comparative rarity. He thought that the cost of erecting, so to speak, an entire village in this style could not prove excessive, while such dwellings were sure to be greatly in demand. He employed the services of Mr. Norman Shaw as architect, a gentleman who, perhaps more than any one else in England, has contributed to the revival of this old style. Plans were prepared by him, and afterwards by other architects, and monotony was most carefully avoided. The roads were made winding, and the houses either stand quite detached or are in pairs, semi-detached. In order to increase the charm presented by variety, the old trees that were on this estate have been carefully preserved, while young ones have been planted along the streets. This bold experiment of Mr. Carr's, for which at first a complete failure was prophesied, has proved most successful. Bedford Park has become quite a noticeable part. Everybody speaks of it. The newspapers publish articles about it, and the houses are eagerly sought after. Within a period of barely six years several hundred houses, a church, a club-house, and a supply store have risen up in the district. The general effect produced by the village is charming. The houses are all of convenient moderate dimensions, and are nowhere pretentious. Few are entirely alike, though all have a generally similar character. They do not stand shoulder to shoulder, but each has its bit of garden-ground, which is often, as we have said, adorned with old trees. The gardens are railed in with unpainted wooden fence of rural appearance. The wooden window-frames and balcony rails are painted white or green. The roofs are covered with tiles, and, in order to soften their glaring appearance, old tiles have been employed along with new ones. The lower window panes are frequently of painted glass. Sometimes the entire window consists of a number of small panes framed in lead, such as up to a few years ago were only seen in very old houses or cottages. There are no shops, as the wants of this colony of villas are supplied by the stores of the association. A school of art, erected in a picturesque style, exists in the village, and there is an inn of still more picturesque appear-

ance. It is named after the hostelry which has been rendered immortal by Chaucer as the starting point of his pilgrims. The whole is very pretty and pleasing, although it may have an appearance of imitation. The character of the community which has gathered here corresponds to the peculiar and idyllic character of the place. The inhabitants are not wealthy. The dwellings are not built for rich people, and yet among the denizens are artists of all kinds, painters, musicians, novellists, actors, and numerous artistic and art-loving personages. The prevailing tone of society there is pleasant, cheerful, companionable. The club-house possesses a library, billiard and conversation rooms, lawn-tennis grounds, grass plots for fine weather, and asphalted covered places for wet days; there is likewise a large dancing-hall and a theatre. The club is open to both sexes, and may be described as a kind of co-operative amusement association.

This is the favourable side of the picture; but, unfortunately, there is also an unfavourable side. On inspecting several of the new and still unoccupied houses, numerous faults have been disclosed, and they are such as considerably to diminish the desire to take up a residence in this paradise. In the brick walls, whose colour produces so pretty an effect, it is found that the bricks are more or less cracked, and there is no doubt that shortly they will be penetrated by dampness. The ornamental tile roofs, too, have failed to withstand the heavy rains which have fallen in the past summer. It is not that the tiles are a bad material for roofing; only they have not been laid so as sufficiently to cover one another. Again, some of the woodwork in the rooms has proved to have been badly done. As soon as the doors dry a little, cracks show themselves in the panels. The door-locks are inferior, and the stoves of the new-fashioned chimneys are often bad. All these, however, are faults in carrying out the construction. They are not defects in the plan itself. It is not the architect, but the builder or operative, that is at fault. These facts are, according to the opinion of Herr Zimmern, a new proof of the demoralisation of operatives in general, and of the operative builder in particular; but we hold that he is clearly wrong in basing so sweeping a conclusion on such narrow data. We agree with him, however, in regretting that these defects should have shown themselves to such an extent at Bedford Park, as ignorant persons will be apt wrongly to ascribe them to the style of building instead of to the builders. There are some defects, however, arising from the style, defects which the tenants soon discover when they find that they have to pay more or less heavily for repairs. Woodwork has been employed in the Bedford Park houses after old models, without asking why they had gone out of use. Thus the outer frames of windows of wood can never be quite watertight, and hence wood had given way to other materials. The garden palings are not painted nor covered with metal. The unprotected woody fibres of the palings are, therefore, at once wet through at the points, and the natural consequence is rapid decay. In many of the houses a platform covered with cement is used, which serves as a roof for part of the lower story and as a balcony for the upper. The chimneys rising from this platform are of a height that is not artistic. In spite of this they do not reach to the upper-roof line, and it is well known that chimneys which are not carried beyond this line have the quality of smoking. The problem of providing chimneys at once elegant and practical has not been solved at Bedford Park. Some good chimneys are there, but only in the houses which were first built.

The church is also a work of Mr. Norman Shaw's; the style is also Queen Anne, and most observers will admit that, however well adapted to dwelling-houses for the middle classes, this style is not suited for ecclesiastical architecture. The church shows a want of beauty, dignity, and, we would also say, of soul. The internal woodwork is painted green. This is a departure from the healthy modern habit of allowing the grain of wood to be seen wherever practical. To coat the well protected wood of the interior of a church with paint appears just as absurd as it is not to paint the garden palings which are exposed to the weather. In both cases that rational adaptation which is the secret of all success in decorative art has been lost sight of. The architecture which is merely a fantastic revival or imitation can never be a living art. When the artist takes care that his work should, above all, be adapted to its aim and end, then it will be capable of living and show real progress. It is to the effort to attain complete appropriateness that the art works of the Greeks owe that perfection which no other nation has yet attained. In English architecture as in English clothing and domestic arrangements, it is too often the case that custom or fashion or the example of others is the guide rather than propriety or suitableness. At present the Queen Anne style has become the fashion; it is adopted by most architects, not because brick is a good material for building, or because it shows the construction and admits variety of form, but simply because others have built according to this style, and they wish to follow the example. There is a lack of feeling for the internal laws of architecture, and hence external forms are applied without understanding or purpose. Gables, dormer windows, and projecting corners have been introduced for their own sakes. Rational sense has almost everywhere been sacrificed to picturesque effect, and so the artistic spirit, which is based on reason, is lost. Nevertheless it is a great advance that the meaningless monotony that once ruled in England is broken through, and that the attention of Englishmen has been actively turned to the exterior of their dwelling-houses. There has hardly yet been sufficient time to reach the rational middle path, but it seems to us that the efforts of recent years, in spite of all defects and faults, have given us the germ of a style which is capable of living.

In another branch of English architecture remarkable things have been accomplished in recent years. Since the passing of the Act making education of the people obligatory, there has been a need for large elementary schools. Thus it is that in almost all the larger towns one or more such schools has been built. For their designs there were no traditional prescriptions. The requirements were clear: durability, avoidance of all unnecessary ornament, light, ventilation, and lofty rooms. To satisfy these requirements, schools have been built that exactly fulfil their purpose, and by this very fact of being adapted to their ends no small degree of architectural merit has been attained. They are large high buildings, constructed of brick, and frequently with a bell-tower serving as a ventilation shaft. The walls, which are not covered with anything in the interior, and show the bricklayer's work, are well put together. The visible roofing is of good timber, and the joinery work well done. As playgrounds in wet weather, there are roomy arcades or open colonnades, the arches being often of truly noble dimensions, as pillars and posts had to be avoided to the utmost possible extent. The men who designed these edifices saw what was necessary, and carried it out excellently and in the simplest manner. The spirit out of which these productions have sprung fills us with more hope for the future than we feel when we see the houses which it has become the fashion to build in Queen Anne's style. Meanwhile, the old Classical style of masonry for which London was remarkable, but which is exceedingly unsuitable to the climate, is decidedly dying out. This is a great advantage. That in England we are gradually approaching the right road cannot be doubted. Already the streets of London have a far less monotonous aspect than that which had so long distinguished them.

TIMBER IN RUSSIA.

It is Mr. Gallenga, we think, who remarks, in the course of more than one of his accounts of travel, that he believes that far more than half the forests which existed at the date of his childhood have now been cut down, without any means being employed to keep up the supply of timber, the loss of which will undoubtedly begin to be felt by the world at no remote date, as agricultural effects, depending on climate, water-supply, and other circumstances, in which the destruction of woods have been the chief cause, have already been felt, and at last recognised, in many parts of Europe. Russia, where wood constitutes almost universally the sole building material, as well as the sole fuel, is already beginning to recognise the necessity of providing for the future in this respect. The northern forests will not last for ever, and they are now disappearing far more rapidly than they are replaced by either natural or artificial means. The trees, too, in these northern latitudes, are much longer in attaining a size suitable for timber than in warmer regions. Government domains especially suffer much depredation, for from them large quantities of timber are stolen during the winter, when the snow quickly obliterates all trace of the marauders, who are the peasants of the neighbouring districts. If this even were wholly put a stop to, however, the economical situation with regard to the wood supply, looked at as a whole, would be but little changed. The total consumption of wood would not presumably be very much greater, though it would be cut with more advantage. The Institute of Forestry, attached to the Petrovsky Agricultural Academy, is an excellent institution, under the management of an able professor, who has his heart in his work. Here a number of young men are instructed in the principles of forest management as far as these are at present known. The most economical ways of obtaining timber supply, the best way of planting, and the knowledge of soils suited to various trees, are demonstrated theoretically and practically. For indoor study there is a capacious and well-stocked laboratory, where numbers of earnest students may be seen absorbed in their work. A good library, supplied with the chief European and American periodical publications bearing upon the subjects upon which instruction is given, and various museums of practical scope, are among the aids to study which the visitor will there note. The present writer has to thank M. Ivanukof, one of the professors who gives instruction at the Academy, for his most obliging guidance and explanation during a visit made to this admirable establishment. M. Ivanukof, besides his high reputation as professor, is well known as a writer on subjects connected with land, and has travelled much for purposes of observation in both the Old and the New World. The College of Lyessovodstvo, or Forestry, has its special museum, which contains a great deal that is, or should be, interesting to the architect and builder, as well as to those more nearly concerned with the production, supply, and preparation of timber.

Among the curiosities is a highly-finished set of miniature tools used in the cultivation or hewing of timber. But specimens of practical instruments of different sorts will there be found, from Birmingham and other seats of iron manufacture. We remember noting an Irish spade, the peculiar elongated form of which resembles a tool much used in certain districts of Russia. One of the most important features of this museum is the section devoted to the investigation of blights, and there is a most interesting collection of blight insects, and of specimens of wood injured by them as well as by fungus, showing the way in which injuries of this sort are inflicted upon timber. The attention of students is particularly drawn to the study of blights, the mode of their propagation, as well as of remedies and preventives against them. This institution is doing an excellent work, though how far it may be able to cope with the denudation of the forest tracts at present going on it is impossible to say.

The forests of the Baltic provinces, which but a quarter of a century ago seemed inexhaustible, are now disappearing at a too rapid rate. Twenty years ago the little port of Libau, which the grain trade is now elevating to importance, was surrounded with forests, and was accounted one of the chief centres of merchant shipbuilding in those provinces. Shipbuilding is now, however, reported to have quite ceased, owing to the absence of timber, all the woods in the immediate vicinity having been cut down, and there being no water communication to float timber from a distance to the spot. The wood consumed as fuel or employed for other purposes is at present mostly brought to the town by coasting boats from the north of Kurland, chiefly from Dondanhen, a locality which at present abounds in wood.

The vicissitudes of climate in Russia seem to have a bad effect upon the timber of telegraph-posts and railway-sleepers. On the 7th of August last, near the Chassof Yar Station, a whole passenger train completely left the rails. This accident, which might have had fearful consequences, is stated to be due entirely to the rotten condition of the sleepers, which, it is said, are much in the same state throughout the whole line on which this occurrence took place. An experiment is being tried on the St. Petersburg-Warsaw line of railway with the object of preserving the telegraph-poles from rotting,

the preservative being salt, in a concentrated solution of which the poles are soaked.

The Government has ordered the preparation of a precise and detailed report of all damage and depreciation suffered by the Russian railways during the years 1879, 1880, and 1881.

It seems pretty conclusively shown that the recent accident on the Nikolaevsky railway was due to the rotten condition of the sleepers. Some of these were so soft that even the point of an umbrella or walking-stick would penetrate them. Many of the passengers who were uninjured, on escaping from the carriages, seized bits of the sleepers, wrapped them up in shawls or wrappers, and treasured them carefully until arrival in St. Petersburg, where they took them to show to the Minister of Roads and Highways. Attempts have occasionally been made to lay such accidents upon the rails, which sometimes break, but, as this is believed to happen only in very severe frosts, no such cause can have occasioned the recent accident.

These facts read rather curiously by the side of a memoir upon the present condition of the Russian railways recently published by the Government in the columns of the Government *Gazette*. In the course of this document the public is told that the considerable sums granted by the Government in recent years for the improvement of the lines, the diminished amount of construction of new lines, and the application of funds from the railway profits to the amelioration of the permanent way, have all been directed towards securing the efficiency of the railroads throughout the empire. So that "at present the ballast, sleepers, and metals upon all the railroads are in the conditions requisite for safety of locomotion, and, indeed, upon some lines in an irreproachable state of efficiency. This is in a large measure owing to the system of constantly renewing the sleepers which has been followed of late years." (!)

THE ARCHITECTURE OF CAIRO.*

The mosque built by order of Amr after his conquest of Egypt (A.D. 640) is now the oldest specimen existing of Arab or Saracenic architecture; the mosque erected by Omar at Jerusalem having been, it may be remembered, rebuilt on a new plan in the eightieth year of the Hejira by Sultan Walid, who covered the edifice with a dome of copper gilt, looted from a church at Baalbek; this sultan, it may be mentioned, was the first to build a minaret, now so essential a feature of every mosque. At the time the mosque of Amr was built, the Arabs had only recently seized Egypt, the first of their long line of brilliant conquests. They possessed, as we have already shown, no art of their own, and especially no architecture. The mosque of Amr was built, so tradition tells us, by a newly-converted Christian, who, as was customary in those, and even in much later days, employed for his purpose the materials of previously-existing buildings. Egyptian, Greek, Roman, and Byzantine relics will be found worked up throughout the whole of the older portions of the mosque. The plan is a large square. The presence of arches that are undoubtedly pointed has more than once been drawn attention to as bearing on the much-disputed question of their first appearance. Certainly their existence is curious here, as also in the contemporary mosque of El Aksah at Jerusalem,—in buildings, that is, of the seventh century.

More than two centuries were to elapse after the erection of the mosque of Amr before any great architectural feature was added to Cairo. The general disposition of the mosque of Teyloun or Touloun, built in A.D. 876,† is similar to that of the mosque of Amr. It is built of red brick, covered with stucco, and, though of coarse execution, is not unjustly regarded as a model of elegance and grandeur; the taste for excessive ornament, which was to mark the Arab art of later times, had not yet made its appearance. But the chief interest of this mosque arises from the fact that it may be regarded as the definite point of departure of Arab or Saracenic architecture. "It is from the mosque of Touloun," remarks Fergusson, "that we must date the complete foundation of the new style. Although there is considerable difficulty in tracing the history of the style from the erection of the mosques of Damascus and Jerusalem to that of Touloun, there is none from that time onwards. Cairo alone furnishes nearly sufficient material for the purpose." With so respectable an antiquity it can be understood that the mosque of Touloun, like that of Amr, in spite of frequent restoration and repair, has now fallen, in the hands of the Turks, into that sad state of ruin which is only too characteristic of all the finer old cities of the East.

Gama el Azhar (A.D. 969-981) is one of the oldest mosques of Cairo, its foundation dating from that of the city proper. An inscription determines the date and name of its founder,—Djouhar, the general of the armies of the Caliph Moez-el-Din-Illah, the builder of the existing city of Cairo. In plan, El Azhar, the brilliant mosque, as it is termed, resembles that of Amr. It contains no fewer than 380 columns, disposed in nine ranks; they are mostly from buildings belonging to the Lower Empire, and, as may be imagined, are of the most varied materials,—marble, granite, and porphyry,—all coupled with the most heterogeneous selection of capitals and bases. In the course of centuries the mosque, an object of the utmost veneration with the Mussulmans, having been frequently repaired, forms, in itself, a monument illustrative of the development of Saracenic art; but its sacred character renders access to it by all but believers impossible, or beset with the utmost difficulty. A college was early established in connexion with the mosque, and here, from every portion of the Mahometan world, students have come for centuries to acquire an acquaintance with the Mussulman religion.

Of the mosque of El Hakem Biamrillah (A.D. 1003), only a few pillars remain. The Gama el Daher is of A.D. 1266. Here the windows are all pointed, and filled with the stucco tracery so peculiar to the Saracenic style and character. The Mosque of El Daher is contemporary with the Alhambra, with the wonders of which there are many of the ornaments executed in stone and stucco in the Mosque of El Daher that might well vie; but, as will be remarked in the buildings of the best period, the decoration will be found to be broadly distributed; it possesses none of that confused intricacy which forms too conspicuous a feature of the Moorish work.

To the year 1356 belongs the great mosque of the Sultan Hassan, in some respects one of the most remarkable mosqu ever erected. "Islamism," remarked the Arab historian Makrisy, "possesses no temple that can be compared to the mosque of the Sultan Hassan for the height and grandeur of the building and for the beauty of its architecture." The mosque is, indeed, for the boldness of its design, its graceful cupola, its delicate minarets, its imposing grandeur generally, and, in detail, its wealth of marble and coloured decoration, its brilliant and varied arabesques, one of the most beautiful monuments of Islamism. Not a small portion of its effect is due, in some measure, to the irregularity of the ground-plan forced on the architect by the circumstances of the site, so successfully dealt with that a thoroughly Oriental tradition relates how the Sultan Hassan caused the right hand of the unfortunate artist to be cut off that he might never trace a rival to the mosque he had erected. Any detailed description such as this work of art merits would be out of place when our space has already been so largely intruded upon.

To the year 1386 belongs the mosque, or rather mosques, of El Barkook (the first of the Circassian mameluke sultans), monuments which Fergusson strangely attributes to the twelfth century (A.D. 1149), not unreasonably remarking on the great change which had come over the style in the period that succeeded the mosque El Azhar, next to which he classes chronologically the mosques of El Barkook.

To 1414 belongs the Gama el Moyed, a "mixed mosque," largely built of older materials, set together in the most incongruous manner; the strongly-marked character of the purest Arab style is, however, plainly stamped on the building.

To 1466 belong the mosques of Qayt or Kait Bay, one *intra muros* the other *extra muros*, both masterpieces of the art of fifteenth-century Saracenic art.

With the early years of the sixteenth century (1517) Egypt became, through conquest, what it has since remained, a province of the Ottoman Empire; from this moment Cairo ceases to be the centre of an active and creative original art. The mosques erected after this time are mere imitations of those at Constantinople, Santa Sophia serving henceforth as the model. In the Gama Khairbekyeh (1520) the Arab art is still pure, the mosque ranking among the most beautiful in Cairo, but the Turkish influence can already be traced. A visit to the mosques erected after this time shows painfully through all the wealth of beauty the decline of the once pure art of the Arabs. As affording the means of comparison, Prisse d'Avennes has given us in his work a representation of the mosque El Sinanieh of the date 1569. Through the succeeding centuries a few mosques continue to be erected, but their interest is alone derived from the still lingering traditions of their decoration. With the political revival in this century these few artistic traditions fled before the pretentious productions of the refugee Italian architects employed by the successive viceroys to adorn and Europeanise their capital. This period can scarcely be said to have yet passed away. The last fifteen years have seen terrible changes in Cairo. Broad glaring streets have been ruthlessly cut through a city whose chiefest charm lay in its narrow cool and picturesque thoroughfares; pseudo-Parisian houses have been erected in every direction, and, not least destructive element, restoration has been carried out too often by far from competent officials.

With the new era which now seems promised to Egypt there is, we are afraid, from an artistic point of view, ground for alarm; we may hope, however, that the interests of art will not be neglected. Cairo is a city which appeals peculiarly to the artist and the archæologist; it offers in its too little known monuments a field of research which will well repay the enthusiastic student whose presence, be he English, American, French, Italian, or Russian, we may depend upon it, will soon follow the restoration of order on the banks of the Father of the Waters.

* See p. 389, *ante*.

† M. Prisse d'Avennes, as we have already stated, is our chief authority.

SIR EDMUND BECKETT ON SCIENCE AND ART.

Before presenting the prizes awarded after the examinations in the St. Alban's School of Science and Art, Sir Edmund Beckett, who resides in the neighbourhood, delivered a lengthy address. Some of the more striking portions may be interesting to our readers:—

If I were only to do my duty,—all that is formally required of me,—I should simply present the pupils with the prizes; but I am afraid they would be disappointed if that was all I did, for there is a passion for talking which distinguishes Englishmen and Englishwomen, which has caused a number of my hearers to come here. I have seen an archbishop, in distributing prizes, try for an hour to vary the monotony of telling young gentlemen and young ladies of the pleasure he had in handing them their prizes, but he was not particularly successful, and therefore I will not attempt to do that. Perhaps the best thing will be that I should make some general remarks beforehand. I must confess, however, that I am in a state of extraordinary ignorance on the subject. Science is a very good thing, and art, in its way, is a very good thing too. But I am afraid that the meaning of both words is a good deal less understood than it should be. I am afraid that the two things are commonly put together nowadays owing to a misunderstanding. I heard the late Cardinal Wiseman give a lecture on the Connexion of Science and Art, and if any one could have made a good case as to the supposed connexion I am sure the Cardinal could. He set to work, gave a very ingenious and amusing lecture, full of eloquence, such as I wish I could give you. At the end of the lecture I amused myself by thinking "how much real connexion between the two subjects has this gentleman shown?" It resolved itself into this. Being a distinguished person in the Church of Rome, and having spent a great deal of time in Rome, he naturally talked about St. Peter's,—a triumph of art of a certain kind. What he said was something to this effect:—"St. Peter's is a very famous place; its dome is almost the largest in the world, and, taking the height and the width together, it is really the largest in the world. But the dome is cracked, and the people set about to mend it."

That was very shabby language to use about such a thing as St. Peter's; but I am in the habit of boiling things down, and seeing what

the meaning of a thing is when reduced to its simplest elements. The best case the Cardinal could make out was that the dome of St. Peter's got cracked, and that scientific men set to work to mend it, and mended it by putting a chain round it. That is not the most beautiful style of mending a crack, and it does not seem to say much for science connected with art. It seems rather like a severance; it appears to show that the artistic people who designed the dome had not much science, and it certainly demonstrates that the scientific people had not much art.

I have been thinking about a good many things of the same kind with a view to finding connexion between science and art, and could never find any until the other day I read in one of the papers as to these classes that the students painted on china, and that the china was fired or burned afterwards to make the colours fast. This is a combination of science and art, no doubt. The art of painting would not do much in regard to china without the science or art of burning. Art means a good many things. There is the art of making bread, and the art of making clothes. The people who call themselves artists are very numerous indeed. I have had to do a good deal with architects, and always found that, for some reason or other, they wish to call themselves artists, though I have never been able to make out why. It seems to me that an architect is not an artist. An artist must do something with his fingers; he does not work with his mind only. An architect does not do anything with his fingers; he merely makes drawings, and tells other people how they are to do the work. A number of people claim the title of artists with much better reason than architects. Painters and sculptors are artists; there is no doubt about them. In modern times singers are called artists in the newspapers; I do not know much about singing, and never go to the opera. Actors are often called artists. Going a little further down, I think I have heard hairdressers called artists. Dressmakers are frequently called artists; and I know also that tailors are called artists. So they ought to be, because they produce very excellent results, and I am not sure but that when they have good subjects to work upon,—very unlike myself,—they produce more successful results than architects generally.

I remember once giving tremendous offence at the Architectural Museum, or some such place, where I was making a speech, by venturing to say that the carvers who executed the ornamental work, such as is now going on at St. Alban's Abbey, were really people almost of as much importance as the architects themselves. Of course the architects glared at me, and some would not speak to me for a week after. Yet, surely, a carver is an artist. The man gets up on a scaffold, and with his few tools chisels out flowers and heads, such as may now be seen by going to the west front of the Abbey. An architect can do nothing of the kind, though he may do what is much greater if he does it well. Art, if it means anything, means the art to do something; it may be a good or a bad thing; by usage it may come to be associated with a beautiful thing, or what people call beautiful. But it is very difficult to say what is beautiful, for there is no canon of beauty that I know of,—no rule except following the example of Nature. There is no unquestionable standard of beauty except Nature. Nature never copies herself. There are millions of leaves on trees, but I defy you to find two alike. This is a lesson I have endeavoured to impress upon the workmen with whom I have had to do here and elsewhere. They imitate to too great an extent. I urge them not to be too exact, but to use a little freedom, as Nature does and as the old builders did. I have pointed out to workmen over and over again pieces of old work. I have asked them to look at a moulding; examining it, at first the moulding seems to be the same throughout, but close inspection shows that the work varies. The old workmen were really artists, and they did as Nature does. They made both sides of their buildings tolerably alike and symmetrical, just as both legs and arms and the two sides of a man's face are alike. But let any one hold up his two hands and look closely at them, and he will find that they are different. The two sides of a person's face are not exactly alike. The same thing applies to the colours of animals. Did you ever find two dogs or tigers coloured alike, or with both sides alike? That is the way with Nature: she works by general uniformity and not by exact uniformity. Nature never copies herself. What I have said is the result of observation of Nature, which is the source of all beauty.

What do you mean by Nature? There are philosophers nowadays who are always ready to state that Nature does everything, and that what they call natural selection does everything. Professor Huxley, who is a most advanced philosopher (a gentleman who believes in nothing but matter and himself, as a great man said once),—is too much of a philosopher not to know the true meaning of Nature. He said, "Nature is only the general result of all causes." He might have said, "Nature is the result of all causes and the cause of no result." Nature cannot be talked of as if she were the inventor and creator of all things. Look at what the thing called Nature has done in the way of beauty. Some of you have been reading, no doubt, that the colours of flowers are produced spontaneously, or by the action of bees. That may be true to a certain extent, but consider to what a small extent it goes. What are bees fondest of? According to my observation in this neighbourhood, they are fondest of mignonette flowers and lime-trees. There is a fine tree of that kind in the rectory garden, and I never go there without being struck with the number of bees about that tree. How much colour have the bees managed to impart to those two favourites of theirs,—mignonette and the lime-tree? They are two of the dullest coloured things in nature. According to the philosophy to which I have referred, bees have been at work millions of years making colours, but they have laid none on those two things. I say, therefore, that they have been a very small cause. If bees made the colours of the trees, have they also made them the shape they are? Have they made the beauty of hills and dales and mountains, and all the forms of water and clouds, and ice and snow, and everything of that kind? It is the object of art to imitate Nature in pictures; and in other ways, by having regard to results, and the observation of methods and laws. Take the rainbow, the most beautiful thing in Nature, and the northern lights, or aurora borealis,—what has produced them?—the regular laws of Nature. Nature is the result of natural causes,—the action of all causes, the action of the Creator, and nothing else. Art is the producing of beautiful results; or perhaps of simply useful results, or perhaps of results which are neither beautiful nor useful.

Next comes science. I began by pointing out that although this is a school of science and art, there is very little connexion between the two things. It does not follow, however, that things which ought to be learned need have any necessary connexion with each other. There is very little connexion between classics and mathematics, yet they ought both to be learned. The real distinction between art and science is that art is uncertain and science is certain,—or ought to be certain. A great many people talk about science, and pretend to arrive at certain results, although they are very uncertain in their knowledge. That is not true science. Science is simply a fine word for knowledge, and knowledge is certainty, or such certainty as is to be achieved. You know, no doubt, that Napoleon Buonaparte was beaten at Waterloo, but most of you would find it very difficult to prove it. That may be called the science of history. Until fifty or sixty years ago electricity was hardly known for any practical purpose. There is a great deal of certain knowledge about it in these days, and a great deal of uncertain knowledge, if I may use the phrase,—that is, a great deal of positive statement, which is no knowledge at all. Some people think they know what electricity is; but a great philosopher,—the greatest philosopher almost of this century,—said, in my hearing, "I have not the least idea what it is." That was Faraday; he said he knew the results, but did not pretend to know what electricity is. But it is the fashion now-a-days for people to be in such a hurry to know everything,—they must be up in the latest theory. They pick up something in the newspapers, and at once talk of it as if it were an accepted truth. They say that there is no doubt that ultimately all force is alike,—gravity is heat, heat is electricity, and everything is everything else. Faraday tried to find it out, but he never got a step towards it. That is the difference between sham and real science. Faraday was really a scientific man, and was not afraid to utter that dread phrase,—"I don't know." What science could do nobody could say, because science was necessarily progressive. Yet people write of what it is certain can be done and what cannot be done. Philosophers proved that steamboats could not go across the Atlantic, and a great many other things, which a few years afterwards were done every day. When people talk confidently about science they should not take things for granted; very often they think they know things which they do not know.

One science is absolutely certain, and only one,—mathematics. There is one infallible rule, and that is the multiplication table. The multiplication table, and the laws of triangles, and things that follow on them, are about the only complete certainties we have. As I have said somewhere else, if a man told me that with dice sixes had been thrown a thousand times running, I should stare at him, and say that the chances against such a thing were millions beyond all calculation; still it might happen. I might tell the person that I very much doubted whether he was not a liar for saying so,—tell him so civilly, of course; but the thing is possible, and therefore I could not positively say he was a liar. But if a man told me that the two sides of a triangle together measured no more than its third side, I should say to that man, "Sir, you are a lunatic. That is only fit for a lunatic asylum. Go there to be believed; don't come and teach it here." So it is with everything connected with mathematics. Linear perspective is mathematics,—there is certainty; and that reminds me that many artists have not the slightest idea about perspective. If a man tells me that his colours are right, I cannot tell him that they are not, not having the knowledge which the artist is supposed to have on that point; but if a person tells me that a drawing which is manifestly out of perspective is in perspective, I say, "Sir, I know you are wrong. You may just as well tell me that four fours are fifteen." Coming to another part of the list of prizes to be presented, I see that free-hand drawing is taught; that is hardly to be called a certain subject, though a near approach to it, and a valuable study. I cannot say much for the painting on china, which is very much talked about at present,—that is "an art." As to chemistry, that is approaching to a certainty, no doubt; but it is only an approximation, and a thing somewhat given to change.

I am sorry to say that I must after all end as I began. I am going to parody a saying of Sydney Smith. He was invited by a nobleman who was not celebrated for hospitality to go and see his house and pictures; he accepted the invitation, and on going to the house was treated with a shabby luncheon. He, however, was shown a lot of fine pictures in gilded frames. When he was about to leave, the host said to him, "Well, I hope you liked it." He replied, "Oh, yes, it is all very fine; but I would rather have seen more *carving* and less gilding." So I would rather have seen more science and less art. We must, however, take things as we find them. It is better to do art than nothing, though I have not a high opinion of it, from its uncertainty and other qualities which I will not recite again. In a letter to me your secretary stated that the art of building is taught in this school. I am very glad to hear it; it is an art that very much wants teaching. A great many errors have crept into it. There is one error with regard to the old builders which I should like to correct. It is said that the builders of old times knew a great deal of science and art. Of art they did know something, but of science little. Art, somehow or other, does not accompany and go along with civilisation, as one might expect. It seems somehow to get squashed by civilisation. People now-a-days are infinitely above savages in knowledge, yet they lack notions of art which some savages possess. Ever so long ago, when I was at college, some weapons made by South Sea Islanders out of stones and sticks used to be shown. When they were examined, the handles of the weapons were found to be decorated rather nicely. In Indian art the work in silver and brass is very beautiful,—beautiful in shape, beautiful in ornamentation, and following Nature in not being too uniform. Take the statuary of Greece, the most famous in the world; they had very little science in those days, nor indeed in the Roman days. At the time the best English buildings were done, down to the fourteenth century, when the work

manifestly began to deteriorate, there was hardly any science. People think there must have been a tremendous lot of science among the old builders, because they constructed those high towers, stone vaults, and other things of the kind. But I have been behind the scenes, and found that a great deal of that work was done very badly indeed. It is true that they had science enough to make their buildings stand for a number of years, but they were bad builders,—did not know how to make their mortar or how to select their stone. They designed contrary to all rules of mathematics and of mechanics; their buildings began to split and almost to fall down from time to time. St. Alban's Abbey has been a succession of ruins and repairs from the earliest times until now. The state of a great deal of it has been before your eyes in the last three or four years. Therefore you should not run away with the idea that the old builders, by some sort of inspiration or magic, possessed science and art. John de Cellâ [Abbot of St. Alban's from 1195 to 1214] was a bad architect; he did not know how to build and make his work stand, or what sort of mortar he should use. He knew nothing of those things, though he was a good artist as far as mere beauty went. If you have classes for the art of building, I hope the students will be taught how to make mortar, how to make proper abutments for arches to stand against, not allowing large arches to rest against 9-inch walls, as was done in the case of the Abbey. Two or three architects wanted to do the same thing again, and more than two or three,—the whole Institute of Architects,—wanted to do it, and if they hadn't had such an obstinate customer as I was to deal with, they would have succeeded. I like walls like myself. Where John de Cellâ had a wall 9 in. thick, over which he put a great arch and window, I put 9 ft. I do not wish to impose my figures on everybody, but what I have done was the result of mathematical teaching. If any of you are going to begin building begin at the bottom, with a mathematical knowledge of mechanics. Mothers, with sons who can draw "pretty things," put them into architects' offices, there to develop their admirable tastes. A young man of this sort is set to work to copy his master's specifications and drawings; he does that over and over again; the parents pay the architect 300*l.* or 400*l.*; afterwards the young gentleman takes an office, and is an architect; and that I am not.

PARKS AND GARDENS IN LONDON.

It is profitable at times to compare the present of things with the past, and thus to find in detail some elements of that progress of which we hear so much. There are certainly, as there needs must be in so vast a city as London, not a few evidences of this, but none more so than in the yearly, we had almost said daily, increase in the size of it, from north to south, and from east to west. Of new house-building there would seem to be no end, and it would certainly tax the imaginative powers of the most hopeful and dreamy to speculate as to its ultimate future. We have before us a map of Old London, showing the Great Wall of it, and when Grayes Inn was out of town, and Spittle Feyldes a garden. This was in A.D. 1593, an almost forgotten date in London history. Our next map is but just half a century old, and it shows Hyde Park and Kensington Gardens, and even the Green Park, field-surrounded, and fairly out of town. The Regent's Park is field-surrounded, and Primrose Hill an isolated mount. Kensington Gardens, with its so quiet and dignified palace, quiet in its seclusion even yet, is now as much in town as is Buckingham Palace Garden itself, and even for a royal palace in these days of progress to be quite sure of a quiet garden, it must needs be at a railroad journey's distance from the huge brick-built city.

It may, indeed, seem strange that this great fact has not attracted somewhat more of public attention than it has done. We have more than once called attention to it as to a growing fact in London's history. Other cities have grown, it is true, and made, in the fact of doing so, no small noise in the world, but none of them quite in the same unnoticed way. A comparison of the London of but half a century back with the London of to-day is sufficiently striking, and there is nought in it more so than the fact of the changes which have taken place in the position, as regards the town, of our great public parks, such as Hyde Park and Kensington Gardens, so noted for its palace and its great trees and the number of them. It would be indeed difficult to divine what the constant dweller in London town would do without the parks. That they are truly the "lungs" of it none will doubt, and that they do their part right well in adding to the healthiness of it is certain. And it thus becomes an anxious matter for inquiry as to what element this is more especially due, whether simply to the wide open spaces, thus affording space for the movement of the air, or to their being grass-covered, or to the number and size of the trees in them, or to the presence of large areas of water, as the Serpentine, in their midst. All these causes probably combine to make of the parks objects of beauty and utility, and sources of health.

But a word or two *in re* Hyde Park. It is a something wonderful that this famous park has existence even, when the rage for "building" is considered, and the opportunity the site of it offered for "building" is taken into account. The history, such as it has been, of this park is curious, though there would seem to be a somewhat good field for research for the antiquary in getting a little more together of its history and first beginnings. Kensington Gardens as they now are, Hyde Park, the Green Park, and St. James's Park would seem at one time to have formed one "manor," as it was termed, and to have been subject to the authority of the abbots of Westminster, and to have formed what was termed the Manor of Westminster. A right goodly domain! But time changes all things, and these three parks, or open spaces, or "woods," as they then were, are now happily public property, and it is for the purpose of reminding at least the artistic portion of the public that this is so, that we call attention to them, and to what is proposed to be done in at least one of them, in Hyde Park. We would, therefore, here state a fact or two not so generally known and kept in view as might be. All, indeed, are interested in the parks, on very many grounds, but our main purpose now is to urge the preservation of the noble trees that are yet left standing, but waiting only, we fear, to follow the fate of the many that have been already cut down within the last few months. Not to be too general, we would name more especially as worth preservation the row of noble trees, of some generations' growth, running east to west, near to the old barrack buildings and storehouse. A glance at a map of the park will show the exact position of them, though, better still, a visit to the spot on which many are yet standing. These trees, many of them, are "hollow," time having dealt in the usual way with them, and they needed, a few of them only, to be protected by a slight iron fencing, thus to protect those that are hollow from further offence and mischief. Much needs yet to be learned of tree growth and death, for it not unfrequently happens that a huge branch or limb of a noble forest tree dies, and eventually falls, while the rest of the tree remains in the full vigour of its life and growth. It is surprising, indeed, to note, even in Hyde Park and Kensington Gardens, and Windsor Forest, and Hampton Court Park, and other places, how vigorous is the growth, and how luxuriant the leafage, of many of the very old trees, and of the quite hollow trees, and where the rising of the sap, or its circulation, must be, one would suppose, totally stopped by the decay of the inner and heart wood or timber of the tree. But it is not so, for the life of the tree and the luxuriance of its leafage are yet there.

There is one item connected with this subject of Hyde Park and its tree growth that may interest and even instruct the scientific. It has been proposed to lessen the number of the trees here and in Kensington Gardens, from the fact of there being too many of them on a given space of ground, and from their growing too closely together, and from their having been too thickly planted. To compare things so wide apart may, it is true, be somewhat venturesome, but we are told by the great traveller,—Humboldt,—that in the forest-tree growth, of which he saw so much in South America and other countries, and where nature does all the work, that the trees grow so thickly that but a very small space is to be found between the separated tree trunks. This, of course, could not be in Hyde Park, but it may well read a useful lesson, and evidence that healthy tree-growth is not injured by the fact of their noble forms growing in thickly-set groups and clusters. Indeed, it would seem to be the very reverse, and that, judging from what nature does in all "neglected spots" of ground, there is advantage in this closeness of vegetable growth. It is a curious and not a little interesting subject, and might be well worth a few trials and a little careful experimenting. It is curious to note in any waste and neglected spot of ground, even in towns, and in their very midst, how close and luxuriant is the growth of the vegetable forms, and how close the tree-growth, should there happen to be clusters or groups of them.

We have ventured to thus call attention to these few facts, in the hope that this important subject of Hyde Park and its tree-growth will receive further consideration before more is done in the doing away with those noble forms of vegetable growth, which it must take generations to replace. We do not venture into details, though it be, indeed, hard to forbear, when so much is done year by year in this special park and Kensington Gardens, which, indeed, forms practically, as things now are, a part of it. That there is much to be done in Hyde Park we do not doubt, but it cannot well consist in cutting down week by week trees of old growth that yet remain in it, or in the further adding to the not a little dangerous and unsightly iron bar, a few inches in height, which line the formal footpaths across it. It is somewhat singular, this last "improvement," and is worth note, and the attention of the Chief Commissioner, for the British public will, in spite of it all, walk on the green grass. Hyde Park but a generation ago was fairly "out of town," and was but a part of the surrounding country; now, at this present date, it is fairly in the very midst of it, and as much surrounded by houses and house-building as the very City itself! Much, as we say, without doubt, remains yet to be thought over and done here, but with kindly nature, not only as worker, but as guide. It is subject of ever-growing interest, if there be one, to the brick-and-mortar-surrounded Londoner.

THE BIRTHPLACE OF VITRUVIUS.

War, which Bentham has well defined as mischief on the largest scale, busily as she has been of late at work, has, within a few short days past, been outstripped in her task of destruction by the action of nature. Since the war telegrams have ceased to detail the destruction of Alexandria and the horrors of the battle-field, perhaps no sadder news has reached England than that which relates the disaster that has overtaken the city of Verona. The rise of the river Adige, swelled by the mountain torrents which have also been wreaking dire mischief over the whole north of Italy and south of Austria, has swept away more than one stout bridge of the classic city, and laid its streets under water to a height that far exceeds any previous inundation. Those who know picturesque Verona will recall how, scattered about the town, the mark will be found on the walls of the height to which the Adige rose in the inundation of 1868. This year, on the 18th ult., the water rose 5 ft. higher than on that memorable occasion, and for days, as the flood retired, the city was three quarters under water.

The accounts that reach us of the destruction done and the misery suffered are indeed sad. To all familiar with the too general poverty of the modern inhabitants of the once wealthy Italian cities of Venetia, the position of the Veronese can be only too well understood. It is the poorer portions of the city that, of course, have suffered the most severely, but even the stouter work of the past has been injured. The solid Ponte Nuovo has been entirely swept away, and Fra Giocondo's famous Ponte delle Navi, after three centuries of sturdy resistance to the swirling Adige, has been so severely shaken by the floods as to be in imminent danger of requiring demolition. Verona, writes a local paper, is in great part destroyed, and the damage done amounts to millions of francs. No words can express the awful disaster that has overtaken the city, writes the *Nuova Arena*. On the river itself, in addition to the entire destruction of the Ponte Nuovo and the wreck of the Ponte delle Navi, the new iron Ponte Aleardi, which was commenced only two or three years since, has been almost destroyed; the Ponte Garibaldi, another iron bridge, has been seriously injured. The picturesque old sulphur-mills on the river were,

of course, among the first to be swept away, and, dashed against the bridges, only served to add to the terrible force of the waters. In the midst of the sweeping destruction, the Mediæval quaintly-crenellated bridge of the Castel Vecchio, still remains standing, as also the old Ponte Pietra, a Roman work, having thus resisted one more of many attacks during its venerable existence.

Divided as the city is in two by the river, it can be understood what damage has been done by the flood. There exists no quay, the houses being built on, in many cases actually overhanging, the river, which sweeps and swirls romantically under long lines of dark arcades and arches.

Every one knows how enthusiastically Mr. Ruskin has spoken of Verona, one of those almost flawless gifts which the Middle Ages have handed down to our prosaic present. As yet no desecrating tramway has invaded the narrow bustling streets of Verona, as is the case in almost every other Italian city of any importance. Overshadowed by innumerable balconies,—for Verona is the true city of Romeo and Juliet, though Shakspeare can never have visited it,—the busy streets seem to have retained in their twilight the living spirit of the day which so many a quaint doorway and architectural detail recalls at almost every step. Classic remains meet one at every turn, to speak of the great citizens of Verona, of whom she is so justly proud, Cornelius Nepos and Pliny, and, above all, that early master of architectural learning, Vitruvius. As the birthplace of Vitruvius alone, apart from the memory of Paul Veronese and San Micheli, Verona holds a hallowed place in the history of art.

Pleasant, delightful city, now so sadly devastated, we can well understand how, two hundred years ago, John Evelyn, when he visited Verona, jotted down in his diary (1646), "Here of all places I have seen in Italy would I fix a residence." The home of the classic recollections which appealed to him, the home of the Mediæval memories of Dante and his protectors the art-loving Scaligers, of all the interest of the Renaissance architects, painters, and sculptors which we attach to the story of Verona, the sad calamity which has overtaken the city may indeed appeal warmly for sympathy from the whole artistic world. We hear a great deal in the present day concerning the destruction caused by restoration, but the destruction worked by the hand of man is paltry compared with the work which Nature is able to perform where her action is left unchecked.

There will, we suppose, be some inquiry immediately made by competent engineers as to the causes of the recent floods in Northern Italy, and means will be devised to prevent the possibility of the recurrence of such disasters. That measures are capable of being taken, and that the danger of the mountain torrents has at all times been understood, may be shown by the great engineering works which, as far back as the sixteenth century, the Veronese architect, Fra Giocondo, planned and carried out in the neighbourhood of Treviso, with a view to protecting that city and the flat plain stretching down to Venice from the possibility of inundation, works which, it may be mentioned, remain to this day as serviceable as when they were first erected.

But the good old architect's bridge at Verona has, as we have said, now been severely shaken. Fra Giocondo's reputation as a bridge-builder was great in the sixteenth century. He was employed at Paris to build the Pont Notre Dame, which only succumbed to modern requirements. The modern requirements of the Veronese have, however, found their worthy citizen's bridge ample for their purpose for three centuries past, and Verona, if it loses the Ponte delle Navi, will have lost one of its most characteristic features. Otherwise there is ground for congratulation that the city of the Scaligers will not have suffered much artistic loss from the recent floods. The chief works which give it in architectural history so important a place, the Church of San Zeno, the Duomo, San Fermo, and St. Anastasio, the tombs of the Scaligers, the huge Arena, the picturesque Piazza delle Erbe and the Roman gateways, the picturesque fortifications, the innumerable Mediæval and Renaissance *palazzi* scattered about the streets, will remain still to delight the traveller to smiling Italy.

But before all is again set to rights there must be much suffering in Verona. The poorer portions of the population will have been the most tried, and though perhaps, from a sanitary point of view, there may be small grounds for regret that many sections of the city will have to be rebuilt, yet the funds that will be required to carry out the work will be sadly wanting.

EDINBURGH.

Upon returning to the city after the summer holidays, we feel some curiosity and anticipate considerable pleasure in making a survey of the different building operations which were in progress when we left. The result, however, is generally somewhat disappointing, for we invariably expect more to have been done during the month or two of our absence than is actually achieved.

Our steps are, in the first instance, by a natural impulse, directed towards Princes-street, and nowhere else do we find a more picturesque and charming urban scene, one where nature and art combine more effectively. Proceeding westward, we observe that the Conservative Club is gradually asserting itself, and remark the careful attention to every detail given by Mr. Anderson, even to the size and joining of the masonry, a matter which is too often left to the discretion of the builder, but which, if judiciously controlled, gives a distinctive expression to the construction. The masonwork of the new chancel and porch of St. John's is completed, and the detail we observe is almost a repetition of that in the original building. One departure, however, consists in the arching of the long windows, which embrace both aisle and clearstory, in which the use of the four-centred arch has not been adhered to; the tracery, too, is slightly varied. We cannot say that we admire the depressed battlemented gable of the porch; a little more freedom might have been used without the additions being out of keeping, and the original structure is not of much account as regards style.

We find that a new south front is being put up to St. Thomas's Chapel. The principal façade is towards the north, and abuts upon Rutland-place. It is a tame modern version of Norman style carried up in two false gables, against one of which is a semicircular projection containing stair to galleries. The south elevation towards Rutland-street was carried out in unison with the plan of that street, in a plain Domestic style, with square-headed windows, cornice, and balustrade. The opposite side of the street was removed several years ago to make way for the new Caledonian Railway Station, and an open place formed, which left the side of the chapel more exposed to observation than before. The new elevation shows two stories of semicircular-headed windows, divided into two lights by shafts, those in the upper tier having a circular pierced opening at the apex. There is a small doorway which has been brought into unison with the rest.

The centreing for the new west door to St. Giles's Cathedral is in place, but, at the present rate of progress, it will be some time before it is completed. We find the chancel still in the hands of the workmen, but are given to understand that it will be opened for public worship in a few weeks hence. The scaffolding of the spire of new West St. Giles's Church has just been removed; it tapers up gracefully over the trees of the Meadow Park. The interior is in a state of chaos, but, so far as observation permits, it appears to be constructed in a thorough manner. The architects, Messrs. Hay & Hardy, have adopted a Scottish peculiarity in using the semicircular arch in the windows of aisle and nave, the general character of the design being of the Flamboyant style, this arch having been used in Scotland in conjunction with the pointed arch throughout all the different phases of Gothic architecture.

The stonework of the new Board School for this district, situated at the junction of Marchmount-crescent and Marchmount-road, is almost complete. The site consists of an acute irregular triangle, and irregularity of plan was a necessity which might have been taken greater advantage of than has been done in regard to grouping of parts; as it is, the building is tame and uninteresting, the new tenements built and in progress beside it having much more spirit in them. The variety and character of the elevations of these new tenements are certainly remarkable, comprising gables, oriels, dormers, and angle turrets, each builder emulating his neighbour in producing something different. The effect is striking, and would be more so if the buildings were not all of a uniform height; but this is most probably regulated by the conditions of the feu charter.

At Watson's College, to the north of the Meadows, an addition to the west of the existing building is being carried out under the supervision of Messrs. Macgibbon & Ross. The additions will partake of the same Classical character as the rest of the building, and will be about 30 ft. long with a depth of 55 ft. The ground-floor is to be utilised as a gymnasium, the second floor is to be appropriated to school-rooms, and the third or uppermost floor is to form one large class-room for drawing, &c. The two upper floors will communicate with the corridors of the existing building. These additions have been rendered necessary by the great success of the school, which is under the care of the Merchant Company, the number of applicants for admission to this and the other schools governed by the company being greatly in excess of the accommodation.

The new Chalmers Territorial Church, at the West Port, begins to show over the enclosing hoarding, and the Newforth United Presbyterian Church is in a similar stage of progress.

At the north-west margin of the grounds of Greenhill, recently acquired by the Messrs. Beattie at a cost of about 4,400*l.* per acre, building operations have commenced. The designs for these works have been prepared by Mr. Hippolyte J. Blanc, and comprise three blocks, each having a frontage of 100 ft. and a height of five stories. The main doors are expressed by projecting porches, having moulded architrave, frieze, and pediment; Venetian windows and oriels alternate, the former having a projection of 4 ft., with three lights in front, and narrow ones at the sides; these are carried up two stories, and the oriels, which are set on a projection of 2 ft. 6 in., rise to the main line of the eaves. The sky-line is diversified by Mansard roofs, double and single pedimented dormers, and large gables with ogee curves, in which are placed square-headed windows between fluted pilasters. From this description it will appear that there is a departure from the common-place builder's plan, and that the aim has been to secure a pleasing variety in outline and detail. Equal attention has been given to the internal arrangements, where the sanitary provisions are to be of the best description. Another departure from the usual plan is that the ground behind each block is to form one area instead of being divided into narrow plots by party-walls.

The new Established Church at St. John's-street, is now completed, and it is satisfactory to be able to report that the interior is more seemly than the exterior, which is positively ugly. Everything within, it is true, is plain, but the proportions are good, and the arrangements well suited for an auditorium; everything seems thorough, and there is none of the pretentious plaster work too often indulged in.

Pretentiousness of the most rampant description appears in the Colston-street United Presbyterian Church. You approach an imposing front with a large doorway and great traceried windows, and turning the corner observe a small oblong conventicle, hidden, or rather meant to be hidden, behind the grand frontage.

The Guthrie Memorial Church is not so pretentious, but it is an unsatisfactory specimen of the Nonconformist Gothic type, with cast-iron columns and wooden clearstory. It unfortunately is placed beside a beautiful little Episcopal church, which it swamps, but an addition is being made to the latter, which may counteract this.

By the will of the late Captain Hugh Reid, a sum of 1,000*l.* was placed in the bank at the credit of the Edinburgh Town Council, to accumulate for twenty-five years, as a fund to assist in the erection of a memorial to the Scottish heroes, Bruce and Wallace. It was suggested that the monument should be in the form of "an ornamental piece of water in the Nor Loch, with a fountain in the centre, and colossal statues in bronze of each hero in conference." The stipulated twenty-five years having expired, the Corporation invited an open competition, stipulating that the cost of the completed design should not exceed 2,000*l.*, and offering premiums of 30*l.* and 15*l.* to the designers of the works which might be con-

sidered second and third in merit respectively. The models to be 3 ft. in height, and the treatment of the design and suggestion as to site to be at the discretion of the competitors. The completed figures to be not less than 12 ft. in height. Seven sets of models have been sent in, as we have already stated, and they mostly represent the warriors clad in mail, Bruce with his battle-axe and Wallace with his great two-handed sword. The designs have been inspected by a committee of the Town Council, but as yet no decision has been arrived at.

By a new arrangement the Corporation has undertaken the supervision of the sanitary arrangements in each house within their jurisdiction. Any citizen having a suspicion that his drains are not in good working order, may give notice to the burgh engineer, who will thereupon send a competent inspector to examine the house, and thereupon a report, containing a statement of the deficiencies and proper remedy, will be furnished.

A proposal was made at the Council Board that the vacant space at the east end of the School of Arts in Chambers-street should be filled with a semicircular recess, as intended by Mr. Cousins, the architect of the street; but this proposal was objected to, as it appeared that the ground might be required for an addition to the School of Arts. The ground in question is very shallow, and it was intended that a screen wall should be erected to shut off the view of a workshop, the recess towards the street being left for a fountain or monument of some sort.

The City Treasurer, in his report. states that there is a remarkable coincidence between the actual expenditure of last year, and the estimated expenditure of the current year. The actual expenditure of last year was 144,335*l.* 5s. 11½d., and the estimated expenditure of the current year was 144,335*l.* The respective items differed widely, but the fact that the totals were so very near was one of those curious things which happen now and then. The estimate for carrying out the Improvement Act for the current year is 20,000*l.*, which is equivalent to a rate of 3½d. per pound on the rental.

CHENIES.

One of the consequences of the feverish life of the present day is the natural tendency of society to seek holiday pleasures in hurried travel, among great cities, in crowded centres, and in the grand scenery of the Alps. English landscapes are apt to be too tame and too wanting in the excitement which has become so necessary a part of modern life to have attractions for more than a few quiet and moderate people. Yet, in some of the least frequented and yet most accessible parts of England, within comparatively a few miles of London, is to be found scenery which is full of charms, and of a quiet and unique beauty which can be seen nowhere else. Among the hills and woods of Hertfordshire there are scenes of woodland beauty not to be surpassed in England. The western borders of this county, and that part of Buckinghamshire which lies to the east of the Great Western Railway, and is bounded by the little river Chess, have a beauty peculiarly their own. The heavier woods of the eastern part of Hertfordshire are lightened by the greater variety of trees,—oaks and beeches and firs grow side by side in the same wood. The streams winding through the "bottoms" give a brightness to the view, and the cornfields and brown-roofed farms bring a warmth and homeliness to the uplands, which are made more distinctive in character by the numerous cherry orchards. It is quite in this pleasant country that one walking northward from Rickmansworth finds the village of Chenies. No spot could better fulfil the idea of a typical English village, whose neat and comfortable cottages are surrounded by gardens bright in summer with phloxes and carnations. The wooded hills and valleys of Buckinghamshire disappear to the west, and on the other side the valley of the Chess sweeps in steep slopes and with a graceful curve, beautiful with woods and cornfields and hedges burdened with the traveller's joy. Past the great clump of elms which shades the end of the village, and the avenue which leads to Sarratt Bottom, and on the brow of the hill, is the old manor-house of the Cheynes. It carries us back for more than three centuries, dating, in its present form, from the reign of Henry VIII., when the first Earl of Bedford, who had married the heiress of the Sapcotes, the owner of the manor, changed the old house which had been the home of the Cheynes, predecessors of his wife's family, into the Tudor mansion which we now see. It has been well preserved against the ravages of time, and though it now is inhabited both as a farm and cottages, yet its mellow red walls and chimneys rising from among the dark ivy, and forming two sides of a triangle, its sunny terrace and bright garden, and the dark shadows of the angled front, give it the beauty without the painfulness of age. Standing alone it would be architecturally interesting, but forming a part of a picturesque village itself, in harmony with the country round, it helps to make Chenies a singularly delightful place. But it is when we cross the road and enter the church that the perfect uniqueness of this Buckinghamshire hamlet is really understood. A quiet country church has always attractions which have never been so fully expressed as in Gray's incomparable Elegy, but the church of Chenies brings into focus a long period of English history. On the northern side of the church is the vault of the Russell family, and above is the chapel in which the monuments, the tablets, and the banners tell of three centuries of an historic family. Chenies possesses the only church in England which is so completely the tomb of one single race, and a race which has entwined itself so well with the best features of our history. We take no note of the Cheyne family, but we find Russell after Russell buried beneath our feet. They begin with that Sir John Russell who became the first Earl of Bedford, a Privy Councillor of Henry VIII., Lord High Admiral to Edward VI., and Lord Privy Seal to his sister Mary. Among them is a well-known historical figure, that Lord William Russell, one of the victims of the Rye House plot; among them also lies the great Whig statesman of our own century. But each generation has brought forth some man who has done good service to his country, though the political position which he has occupied has not been so high as to cause him to be an historical figure; but men and women, generation after generation, they were brought for burial to this Buckinghamshire churchyard. The mere fact that these men lie here is, perhaps, the most enduring and the most striking monument they could wish, and the small black marble slabs are more telling than the more elaborate monuments which are also to be seen in this chapel. In fact, the great structure which occupies the west side of the chapel in which William, the first duke, and his duchess are seated in full court dress, with medallions of their children round, in the florid and disagreeable taste which marks English monuments of the seventeenth and eighteenth centuries, seems wholly out of place. That which artistically is most attractive is the fine alabaster monument which represents the first earl and his wife laid recumbent side by side. The figures are of life-size, and the work is characteristic of the period and of the style of which Torrigiano was the chief master in this country. The most barren spot filled with these memories would be full of interest, but when to them is added the picturesqueness of a pretty English village, the charms of a singularly attractive county, and the mellow beauty of the old manor-house, the epithet which we have applied to Chenies that it is a "unique" village is obviously no more than the truth. It may, indeed, be almost called the most remarkable village in England. Fortunately it is not likely to lose its quiet charms, which agree so well with the last resting-place of a great political house. The railway is at a distance, and, amongst strangers, it is chiefly the trout fisher who has been fortunate enough to obtain a day on the Chess who most frequents Chenies.

Liquidations in the West.—Builders in the neighbourhood of Exeter seem rather "shaky" just now. Within the last few days the failures have been announced of Mr. Thomas Redway, builder, of Exmouth (Mr. Redway is the partner with Mr. Moass for building Sir Henry Peek's mansion at Rousdon, under Messrs. Ernest George & Peto, architects); of Robert Davis, of Newton Abbot and Exeter, builder (this bankrupt is stated to have absconded); and of Frederick W. Vanstone, builder, of Torquay.

HEALTHY HOUSES AND HOW TO SECURE THEM.

Prof. Henry Robinson, C.E., in his address as president of the Engineering and Architectural Section of the Newcastle Health Congress, said:—Engineers and architects may agree on right principles, and may devise skilful means for carrying them out, but their field of labour will depend entirely on the appreciation by the masses of the requirements of health. There is less difficulty in getting people to see the necessity for new roads or railways, and to find the money for them, than to find the money to make their homes healthy. Referring to house sanitation, he said it is no exaggeration to state that not one quarter of the dwellings of all classes, high or low, rich or poor, are free from dangers to health due to defects with respect to drainage, water, or ventilation which were capable of being easily avoided at the outset. The public are now more alive than they were to the necessity for inquiry into these matters, and consequently sanitary authorities (who cannot go much ahead of public opinion) are better able to enforce regulations, and are more willing to bear the expense of doing so. To ensure healthy homes, local authorities should have by-laws requiring compliance with general rules, which are now well known and hardly require to be specified. It is obvious that the condition of the drains, soil-pipes, ventilation, &c., of the old houses should also be the subject of investigation. But it is not till the attention of the Medical Officer of Health is arrested by the occurrence of fever, or other form of illness, that their condition is inquired into at all, although they might have been in so unsanitary a state as to be unfit for habitation. The conversion of unhealthy old dwellings (which form so large a proportion of the houses in large towns in this country) into healthy ones is a task which, without reference to by-laws, presents no attractions from an architectural point of view, but has nevertheless to be undertaken by those who are best fitted, from their position and influence, to deal with the subject. These observations apply with the greatest force to the houses of the poorer classes, who have not the opportunities of exercising any critical supervision of their own. As regards the houses of the better classes, the same remarks apply to a greater extent than should be the case, considering the irretrievable mischief consequent on treating these matters apathetically. In order to direct attention to the condition of houses, and to expose their unhealthy state, the following plan is suggested: It should be compulsory on the part of medical men, or of the occupier, after notification by the medical man, to return to the Officer of Health for the district any case of illness of the classes agreed on as arising from sewer gas, infected water, and the like. This notice should be accompanied by particulars of the house in which the illness occurred, and whether it was an imported case or originated in the house. It should then be the duty of the Sanitary Authority to have affixed to a plan of the district a coloured wafer or dot corresponding with each disease. This plan should be open to public inspection, as well as any reports explanatory of each case. The effect of this would be that a house, or group of houses, in which filth-diseases occurred would be revealed at once to the eye of an intending occupier by the array of wafers, warning the unwary against the danger they are running. This suggested registration of disease by maps appears to be in operation in Newcastle. In the *Lancet* of the 16th of September, it is stated that a map "records, by dots of different colours, all the cases of scarlet fever, enteric fever, typhus, small-pox, and whooping-cough, according to the locality in which they are reported." It is further stated that all such cases are voluntarily notified to the officer of health. Dr. Armstrong deserves well of all sanitarians for having introduced this system. A means of compelling inquiry into fatal cases of typhoid and enteric fevers, and similar diseases arising from preventible causes, would be to require an inquest to be held, at which evidence would be elicited which would point to the cause of the disease, and the necessary steps to remedy the mischief would follow. On the efficient way in which the plumbing and sanitary work in a house is executed depends, to a large extent, whether a house is healthy or not. Experience proves continually that much of this work is done by incompetent or careless people, and

requires subsequent rectification, probably after illness has caused an investigation to be made. In America, legislation has aimed at correcting this evil by making it a penal offence for plumbing work to be badly carried out. He contended that an intending purchaser or occupier of a house should require a certificate that certain stipulated conditions have been fulfilled. This would render it necessary for the landlord or vendor to ascertain (what is only equitable that he should) that the house is fit for habitation before he derives any benefit from his property in it. Similar certificates should be required for all new houses, and no one should be allowed to let or sell a new house until the local authority had given a certificate. This would involve more inspection and a larger staff than now exists, but the cost of this might fairly be borne chiefly by the builders, who should pay according to a sliding scale.

"INDUSTRIAL DWELLINGS" FROM A SANITARY POINT OF VIEW.

This was the subject of a paper read by Mr. John Price in the section devoted to Engineering and Architecture at the Newcastle Sanitary Congress. Mr. Price, as resident agent of the Newcastle Industrial Dwellings Company, says, —Twelve years' continuous residence in a block of industrial dwellings, and thirty years' intimate association with the working classes, enable me to speak practically as to their opinions and requirements, and that as great a diversity of views exist amongst them on sanitary matters as amongst any other section of the community. Some have great regard for their own health and that of their family; others treat this important subject with ignorant contempt. The low death-rate exhibited by blocks of industrial dwellings in contrast to the surrounding neighbourhood is a striking proof of their healthiness. The London Improved Industrial Dwellings Company, which now provide accommodation for about 20,000 persons, shows an average death-rate of 16·4 in the 1,000 for the year 1881, against 21·2 in the metropolis generally during the same period. The dwellings of the Peabody Trust exhibit an average death-rate of 17·22 during the same year. The Metropolitan Association record an average death-rate of 14·3 in the 1,000, whilst the block belonging to the Newcastle Improved Industrial Dwellings only show an average death-rate of 12 in the 1,000 for the year ending 30th June, 1882, which is more satisfactory when it is remembered that the majority of the tenants belong to the worst paid section of the labouring classes. This may be considered a striking testimony of their value from a sanitary point of view, apart from all other considerations. The evidence given before the recent Parliamentary Committee shows that the problem of how to provide the lowest class of the poor with healthy dwellings has not yet been satisfactorily settled. The poor in many cases have been driven from their homes, and excellent dwellings erected on the sites, but at rents much beyond the means of the poor. Companies having heavy charges on their revenue naturally make a satisfactory return one of their first considerations. The poor can only expect relief from philanthropic aid in the matter of better dwellings. Industrial dwellings, to be successful, must be placed in convenient situations, and possess essential sanitary requirements. The working man, both in London and in the country, strongly objects to travel far from his home to his work, and will sacrifice many advantages for this one great privilege. Industrial dwellings should not be too lofty for the tenants, should be spacious, well ventilated, and have a plentiful supply of pure water. The stairs and landings should be of fire-proof construction, the steps easy to ascend. Water-closets, which should be situated in an offshoot from the main building, should be of the simplest construction and well ventilated, a simple metal or earthenware pan, with feed-pipe flushing-rim and plug, the most serviceable for large buildings. These should be under the sole control of an attendant, who should inspect these places, as well as the sinks and drains, daily, to prevent the stopping up, which so often occurs when left to the tenants, especially when these conveniences are used by more than one family. The prejudice which existed against the first-built block of model dwellings is now dying away. Handsome buildings built to suit the requirements of the working-classes are now to be found in London and elsewhere. The dwellings belonging to the Newcastle Improved Industrial Dwellings Company, though a comparatively small block, have shown excellent result,—the death-rate only averaging twelve in the 1,000 for the year ending 30th June, 1882. The buildings are now fully occupied, the majority of the tenants being labourers on the Quayside and surrounding neighbourhood. The operations of the company have in many ways been productive of benefit to the neighbourhood, and limited capital alone prevents their doing still more. Much regret has been expressed that the Corporation of this city has hitherto done but little to assist this movement.

In the discussion that ensued, Captain Galton said that the question before them was becoming in our town populations one of absorbing interest. The price of land was, no doubt, one of the greatest difficulties. Of course it was possible to erect dwellings outside towns, but there was an early limit to that, because a very large number of the class of population for which they were intended must live close to their work. It was there where land was the most costly, and therefore he would commend to the attention of town authorities the importance of assisting private enterprisers willing to devote themselves to making improved industrial dwellings.

Mr. S. Alcock said that this was one of the most important questions that could come before them, and he thought after all they could only look upon industrial dwellings companies as pioneers of the way in which these dwellings ought to be provided. Unless it could be shown that these companies could provide dwellings which would give remuneration for the capital persons invested in them, what they would be able to do would be infinitesimal; they would not succeed really in providing for the wants of the working classes generally. So far as Sunderland was concerned, they had very advantageous dwellings for the working classes, consisting of cottages of one story, self-contained, and having three or four rooms, at a rent of 4s. or 5s. per week.

Alderman Cail said that in Newcastle and Gateshead there was a class of houses very valuable to the working classes. The buildings were two stories high, and each story was a self-contained house, with distinct outlets, yards, and conveniences. These houses were being built to an immense extent, and he thought they would meet the wants of the working classes in the best manner possible.

THE SCOPE AND INFLUENCE OF ART.

Mr. George Aitchison, A.R.A., as president of the Art Department of the Social Science Congress at Nottingham, concluded his opening address with the following words:—It is the true nobility of nature that pervades our race, that makes the very highest literature equally admired by the Queen on the throne by the poorest peasant, "One touch of nature makes the whole world kin." Horace's maxim that if you want your hearers to weep you must weep yourself is true of every art; it is the intense feeling of a passionate nature expressed by the subtlety of skill that makes all true and noble art:—

> "'Twas partly love, and partly fear,
> And partly 'twas a bashful art,
> That I might rather feel than see
> The swelling of her heart."

In painting, this master-chord of nature is sometimes touched, and then, though the beholder may be ignorant of the technical merits of painting, he is forcibly impressed. No one ever looked at Francia's Madonna mourning over the dead Christ, in the National Gallery, without tears coming into his eyes. Sir Edwin Landseer knew, loved, and honoured dogs, and his "Chief Mourner" is one of the most popular pictures of modern times, not in England alone, but amongst all civilised nations. You may see engravings of it in the shops of every capital in Europe; but, as a rule, both in painting and sculpture, we must look upon anything that is the mere petrifying of a momentary emotion or movement, as nothing but a feat of skill: beauty and calmness, dignity and composition, are much higher and more proper qualities, as the same action or the same expression is ever with us. The great Italian painters, when they painted a martyrdom, avoided the physical agony and dwelt on the seraphic calm and resignation of the saint, who was already tasting the delights of Paradise. We look for gorgeousness and exquisiteness of colour in painting as its peculiar attribute, and we also look for perfection of form and grace, and subtlety of composition in sculpture and painting. If we want the expression of passion and violent action we look for it in the drama. When we deal with genius in one line of achievement we may perhaps make an approximate scale, but we have no means of comparing different classes of genius with one another. To discover a natural law or the application of one, to invent a machine, to solve a great engineering problem, may require as much genius as to paint a picture or carve a statue, to write a poem, or to compose an oratorio; so I shall not attempt to exalt the great architects above the great men in the other fine arts, but, at any rate, I know more about the difficulties of architecture than about those of any other fine art. A building has to be made convenient for its purpose, and to be securely built,—both difficult arts, though perhaps not fine arts. It must be imposing, dignified, or graceful, before we admit it to be architectural, and yet the difficulties may be almost insuperable; to take a high rank, it must plainly declare its object; it must, at all events, not be mistaken for a class to which it does not belong, and, moreover, it must be in accordance with the tastes of the age. But what if the age have no taste, and only asks for a brick wall with holes in it, what is to be done then? You may point to many a fine front as a contradiction, but be sure that, however fine that front may be, if there be a back that only the owner sees it is a plain brick wall with holes in it. If it were done for the owner's delight he would be more anxious for the part he sees to be beautiful than the part he rarely or never sees. I was once at a doctor's before his last patient was done with, and the doctor was impressing on him the advantages of cleanliness, and finished up by saying, "And be sure you wear a clean shirt." Thinking the patient's shirt was as clean as my own, I said, as soon as I was alone with the doctor, "You are rather emphatic about a spotless shirt"; but the doctor said that it was only a "front,"—that the man must have worn his shirt for six months, it was as black as the back of the chimney. So you see that though the patient was desirous of being thought clean, he did not care for cleanliness himself. A real love for anything is the beginning of culture, and is a stimulus to the creative artist; but a pretended love is merely a blighting curse; to love plainness is the honest confession of insensibility; to love dignified or elegant simplicity is to love the very highest form of art. I would fain see every man having his own house built to meet his own requirements, both of arrangement and beauty, and not living like a soldier-crab in the left-off shell of some one else. And that he should at least have something put on it that is interesting to him, and have this done by a good sculptor, or a good painter, an episode of his life, a family tradition, or something natural that he loves, be it but a dog, a cat, a sparrow, or a flower. There is one thing we may all desire, and which applies, not only to architecture, but to all the fine arts, viz.,—to have art-schools in all the large towns,—not drawing-schools only, but the art itself, flavoured by the genius of the place. As the French sometimes say in praise of one of their wines, "It has a smack of its native soil." We do not want everything to have the London flavour. In Italy, we have the Tuscan, Umbrian, Venetian, Lombard, and Bolognese schools,—nay, even Florentine and Siennese schools,—and why should we not have the schools of Nottingham and Liverpool, York and Manchester? Separate schools would cause a generous rivalry, which would not be without its effect. There are two theories of government at each end of the scale, one in which government does everything and possesses everything, down to the penny steamboats and the apple-stalls; the other, which confines it to external and internal police and the enforcement of contracts; and I think, as a rule, our prayer should be that of the French merchants, "Let us alone." Still there are certain things to be done and certain contributions to be made by all for the good of all, and this the Government alone can enforce. Every Government should at least desire to have the people free, virtuous and healthy, courageous, industrious, and happy. Doubtless the way of obtaining these six desirable conditions is being shown in

the other sections, but we want more; we want every one of our people to be raised by the exercise and enjoyment of all his higher faculties, and for the sake of the nation we want all our human raw material to be worked up. When we use the word "free" as applied to costly things, we know that nothing is free but light and air, and few of us can get our due allowance of these; what we mean is, that they must be bought by national co-operation, every man paying his quota, and every one getting his full enjoyment. So I say we want free parks and gardens, free lending and reference libraries, free picture-galleries and museums, and,—I suppose the musician will say,—free music. And that these may be used and enjoyed by the bulk of the nation they must be open on the one day in the week when the people are free from toil. You may open all our national churches from sunrise to sunset the six days they are now shut. I, for one, rather envy the Moslem and the Roman Catholic their freedom to enter their churches and mosques when they like, and to pray if they please, while we poor Protestants can only do so for a few hours on Sunday. I would add fine contemporary buildings and monuments enriched by the sculptor and painter. Such things stimulate emulation more than any number of triumphs of by-gone days, and can be seen Sundays and week-days alike. The Government does something for architecture when it picks out the best architect for a public building, and it did something once for painting and sculpture when it had the frescoes and statues at the Houses of Parliament executed; but, as far as I know, it has never done anything for poetry, for music, or for the drama. It must be a great incentive to excellence to have a poem declaimed, an oratorio played, or a drama acted before the assembled people, and with all the excellence and appropriate surroundings that a nation only can afford. We have colonies and dependencies in Asia, Africa, America, and Australia, and nothing is more wanted than a means by which all these branches of the English race may be knit together. Our one national holiday is the Derby Day, devoted to horses alone. Is it too much to suppose that we might have combined with it for one week, and with the betting-ring suppressed, a festival to celebrate the highest achievements of men? If the ancient Greeks could do it, why could not the England of to-day?

FILLING THE PORES OF WOOD.

Stained or painted woodwork is finally submitted to the various treatments known as polishing, rubbing (with wax), or lacquering or japanning. Those processes are intended, on the one hand, to beautify the work or to give lustre to it, and, on the other, to protect its surface against exterior injurious influences, consequently to impart to it greater durability. By closing the pores of the wood it becomes smoother, and is capable of greater resistance. Very much depends upon an efficient closure of the pores, also upon the operation being effected with the proper substances. The latter should harden within a few hours, and should not undergo any changes from exterior influences during their transformation which might have injurious effects upon the layer of polish, lacquer, or wax. Although in recent times means have been placed at the disposal of the workman which meet all these evils, in nearly every one of our joinery and cabinet-making shops the old method of filling the pores,—smoothing or polishing with linseed oil and pumice-stone,—is still practised. Our joiners and cabinetmakers of the old school will have nothing to do with newer methods, because their shops are worked on the old system of smoothing with oil; it is said that the wood becomes brighter through the oil entering it, and the system permits them to dispense with the more elaborate treatment with plane, scraper, glass-paper, and Dutch rush, which is indispensable in the methods of filling the pores, as described below, and which we copy from an article on the subject in the *Deutsche Tischler-Zeitung*.

The writer of the paper, Herr L. E. Andés, of Vienna, admits that as regards the polish of the obtained surface, smoothing with oil has the advantage. On the other hand, it is a well-known fact that work thus prepared loses in appearance in a very short time by the sweating of the oil. The outside smooth surface becomes rough and dead, loses its polish, the percolating, not yet dried, and consequently still sticky oil absorbs dust, and the furniture, &c., loses in colour, and a repetition of the polishing process becomes necessary. As a matter of fact, the sweating of the oil cannot be prevented by this method, for the fine particles of pumice-stone which, mixed with the oil, fill up the pores of the wood, retain the fat substance. The wood itself has eagerly absorbed all the oil, its cells are deeply filled with it; and when the linseed oil, if exposed to the influence of the air, dries only after six to eight days, it is quite out of the question to speak of a solidification of the whole. Now, it is generally the custom to begin with polishing directly after smoothing. Thus we apply the polish upon a surface not yet dry, polish it, and only then, when this latter operation is completed, we give to the oil, which now is no longer in contact with the air, an opportunity for drying, by standing in a warm room, &c.; but in course of time, the oil below the layer of shellac begins to dry up without exposure to heat; the shellac layer is torn into numerous fine cracks and turns rough, while at the same time the fine particles of pumice-stone are beginning to come out. The still sticky oil absorbs all dust, the pumice-stone particles become more prominent, and we have, as the result, instead of the desired shining surface which should remain smooth, a rough, dirty crust, which disfigures our furniture.

The durability of the lustre and the smooth surface can be guaranteed only if the wood, after smoothing with oil, is left for six months before being polished. By that time the putty formed of the pumice-stone and linseed oil is perfectly dried up, and the polish then applied is lasting, and the sweating of the oil prevented. But as, under present conditions, it is almost impossible to let work stand so long, it is highly desirable that means should be found by which we might be able to dispense with oil altogether. Herr Louis Köhler, of Giessen, suggests the following method:—"Polishing is still the same operation that it was 100 years ago. The polish has also remained the same, without essential improvement. And yet the whole process is very faulty and imperfect, and as long as it is pursued, the exudation of the oil and the deadening of the best work cannot be avoided. If no oil is to sweat out of the wood, none must be put in; the latter, however, is done on a large scale with the old procedure, consequently the work is spoiled. Now, instead of smoothing the wood with oil and pumice-stone, it is only necessary, after the piece of work is completely finished, to put on the lacquer with a so-called badger brush. This is done quickly because the lacquer (a spirit lac) dries at once. Successive coats of lac are applied until a so-called ground is obtained. Porous woods, of course, require more lacquering than close-grained kinds. If the work is well performed, the whole is now smoothed with fine pumice stone, rotten stone, or hartshorn. The polishing is proceeded with, but without oil, only a little of the latter being used for finishing."

This procedure effects one thing. The pores are completely sealed up with shellac, and as no oil can enter, none can exude in course of time. Spirit lac, however, is expensive, and we must therefore try to employ other materials which close the pores of wood by a simple and cheap process. This may be attained by sizing with glue-water, by coating with starch-paste, or by filling the pores of the wood by the American method, with "wood-filler." By either of the three methods the pores of the wood are completely filled, and as no oil enters the wood, none can come out afterwards. Sizing with glue-water is almost exclusively employed for soft woods, the size being applied three or four times with a brush. After drying, raised fibres of the wood are rubbed off with fine glass-paper, and polishing or japanning is proceeded with in the usual manner. Coating with starch-paste is much more advantageous than sizing, starch once dried being perfectly impervious to exterior influences. A moderately thick paste is prepared by pouring and stirring in boiling water a dough made of powdered starch and cold water. The wood is coated as required with a brush, and then treated as usual.

The most perfect process of filling the pores of wood has come to us from America. At the Philadelphia Exhibition of 1876 articles of wood were shown for the first time the almost startling smoothness and high lustre of which astonished all experts, the latter properties being enhanced by the contrast supplied by objects, japanned and polished in the usual manner, exhibited by the side of them. The procedure by which this extraordinary smoothness and, at the same time, extremely small consumption of polish or lacquer are attained is a very simple one, and is based upon a mechanical closing of the pores of the wood by a composition of certain ingredients, hitherto the property of the inventor. This composition, termed "wood-filler," is supplied in closed tins as a thick, sticky mass, and in applying it the quantity to be used is thinned to the consistency of ordinary varnish by adding good turpentine. The mass thus prepared is put on to the finished woodwork with a moderately stiff brush, and left to coagulate. When this coating, from a shiny appearance, becomes dull, the mass is rubbed across the grain of the wood and well into it with a handful of wood shavings or a suitable piece of wood, at the smooth bottom of which a piece of stout leather has been fastened. Care must be taken that everything on the wood is rubbed clean off, only the "filler" remaining in the pores. The wood thus prepared is left to dry for the space of eight hours, this being quite long enough to harden the filler. The latter is also said to act as a preservative of the wood, as it is not attacked by the influence of the atmosphere, nor by chemicals. After the hardening of the filler, the wood is once more well rubbed with glass paper, and the polishing or lacquering may be at once proceeded with. Less polish, time, and labour are said to be required than with the usual method; no sweating of oil takes place, as none has been absorbed by the wood. The lustre is, at the same time, most remarkable; there is a glassy surface; its durability is stated to be unlimited.

The American wood-filler is supplied in two colours,—white for light woods, brown for dark woods. Any shade may be produced by a corresponding blending of the two. The white wood-filler consists of one part by weight of pulverised starch, one part of barytes, and one-sixth part of dryer; the dark filler, of the same materials, with the addition of one-half part of brown. The finely-ground dry substances are well mixed with the dryer, rubbed down fine in a colour-braying machine, and are now,—thinned with turpentine,—ready for application as "wood-filler."

THE FLOORING OF COLOGNE CATHEDRAL.

This question has for a long time occupied the attention of the cathedral authorities, and, although public notice has not been taken of the fact, experiments have been carried on in a small portion of the northern nave, which has been enclosed for that purpose. Looking at the matter from a theoretical point of view, the *Cologne Gazette* remarks that the principle of Gothic architecture, which introduced pillars instead of wall-surfaces, tended to encourage plastic instead of pictorial ornamentation as an adjunct of ecclesiastical architecture. Polychromatic and mosaic effects were gradually banished, and the Chapter is reminded that, however appropriate a flooring in a carpet-pattern might be in a church built in the Roman style, such an arrangement would be out of place in such a representative monument of Gothic architecture as the Cathedral of Cologne. The importance of uniformity between the general ideas which pervade the architecture of the cathedral and its flooring is urged in the remarks made. It is maintained, however, that with proper limitations as to colouring and style of design, an ornamental flooring is not out of place. St. Bernard used to protest against the flooring of churches containing representations of a sacred character which would be subjected to the desecration of being trodden upon. The *Cologne Gazette* is of opinion that this argument is liable to be carried to excess, for there is never any scruple in exposing the images of saints to all the winds of heaven on the exterior of a church. It is urged that the stained-glass windows point to the necessity of the flooring not being entirely devoid of ornament, and as a limitation of the extent of pictorial decoration allowable in such a case, it is remarked that the figures should never become plastic, or apparently rise from the surface.

As to the material for the flooring (apart from the question of its ornamentation), none of the various plans suggested seem to have

met with universal approval. Marble, sandstone, and ceramic ware are the three principal substances between which a choice may be said to lie. Marble is practically excluded, from the fact that its costly nature would only render its employment excusable on the ground of the dignity of the purpose for which it is used. Thus there only remain stone or dull unglazed tiles, and a combination of the two is suggested as a possible means of solving the difficulty.

The plan which is now before the chapter is nominally an improvement upon one designed in June, 1881, the drawings of which do not appear to bear any signature. The improvements do not seem to have any practical valne. A chequered design of the commonest kind is (according to the *Cologne Gazette*) the foundation of this plan, and it is remarked that it is of a character which would be condemned if suggested for a railway station or a market. It is stated that this plan is designed to be carried out in marble. It is urged that a thorough examination by competent authorities of the entire question is absolutely necessary.

TECHNICAL SCHOOLS.

Mr. William Woodall, M.P., in concluding his address as president of the Education Department of the Social Science Congress at Nottingham, said:—I must now ask leave to return to the pupils of the primary schools, for whom we have seen provision made up to the time when, by age or by compliance with the educational conditions, they leave to take their part in industrial occupations or the other duties of life. With a large proportion of these, as is well known, the leaving school is equivalent not merely to the discontinuance of a study, but to the loss of the major part of what has been there acquired. No view of our subject is more worthy of careful and earnest thought than that which prompts us to take steps which will make permanent the acquirements and the good influence of the school, and to devise some way by which the zest for knowledge may be strengthened, and continuity of instruction be unbroken. In some Continental countries children are allowed to go into employment at twelve, on condition of their attending the *Fort Bildung Schule* until they reach sixteen. But whether compulsory attendance is enforced or not, throughout Germany the necessity for these Continuation Schools is universally felt by the authorities, and they are greatly appreciated by the people. There is much diversity in their character, and the titles by which they are known; sometimes the classes are held on two half-days a week, sometimes as Sunday schools, generally in the evening, and in the Communal Primary School Buildings. They undoubtedly serve useful purposes in preventing the waste of the labour and expense incurred in primary instruction, they carry on pupils to the age when they are more likely to realise for themselves the practical value of knowledge, and apparently they prepare their pupils, by cultivating in them the habit and taste which find profitable exercise in the various technical schools which are now exciting so much interest. The experience of our English Mechanics' Institutions has been that an interval of some three years usually elapses between the time at which a boy leaves his day school and that at which he is prompted to join an evening class. The gap finds him without the controlling restraints which in former days were part of the discipline of apprenticeship. He is in the possession of new freedom and new appetites, and exposed to mischievous influences against which he is as yet unarmed by the knowledge he is destined to acquire only by costly experience. The filling of this gap is the problem which has exercised, not without success, the minds of many earnest people, and nowhere more than in this good town of Nottingham. Hitherto the Government aid given to night schools was limited to payments for instruction in the "three Rs." In their time these evening classes have been of considerable utility to those who had to lament the neglect they had experienced in their early days. But, happily, this class is steadily disappearing, and under these circumstances the Government have wisely remodelled the provisions of the Code affecting night-classes, and grants are now to be paid in aid of teaching in the class and specific subjects, as well as in the higher elementary standards. The concession is a most important one, and the changes are avowedly for the purpose of supplementing the work of the day schools. These new night schools ought now to be made to serve, in conjunction with other classes diversified according to the occupations and wants of different localities, the purpose of the *Fort Bildung Schulen* of Germany. Obviously, too, these classes ought to be able to earn grants from the Science and Art Department, and every such school should be the nucleus of a group of technical classes, such as those which, to their honour, the representatives of the local trade unions, in concert with the educationists of Nottingham, are endeavouring to establish here for training, as they express it, "both the mind and hand of all persons engaged in handicraft trades, so as to make them intelligent and skilful workmen." In company with my colleagues the members of the Royal Commission appointed to inquire into the subject of technical instruction, and in discharge of the duty confided to us, it has been my privilege to visit many foreign countries and to see much of what is being done on the Continent. You will not expect me to anticipate in any statement here the report which will be made to Parliament when our investigations have been completed. But there are facts which are open to the view of every intelligent observer. It is impossible to over-estimate the zeal and activity which is everywhere apparent, or the vigorous and costly efforts which are being made to satisfy the eager demand, or to stimulate the desire for instruction. The preliminary Report of the Commission presented last February will have testified to the progress which France has made in recent years, and to the fact that from the commencement of the present year education in all the elementary schools is gratuitous, as is also the case in all the superior primary schools in which technical instruction is given or trades are taught. The action taken by the State is well seconded by the municipalities, by other local bodies, and by trade syndicates, while the religious orders engage in vigorous emulation. The expenditure, though large, is fully sanctioned by the public sentiment, and the evening classes which we visited in Paris, Lyons, Toulouse, and other prominent centres, especially those in industrial art, were generally crowded to inconvenience. Apprenticeship schools, respecting which much valuable information has been published by Mr. Sylvanus Thompson, complete the necessary training for particular trades, while in the primary schools much attention is given to drawing and modelling, and in numerous schools in Paris the boys have manual teaching in wood and iron given in large school workshops furnished with lathes, benches, &c., for the purpose. In the German States, in Italy, in Switzerland, in Belgium there are equally earnest manifestations of the value which is set upon professional and technical training for all ranks. Besides the complete graduation of schools which lead up from the primary, on the one hand by the Gymnasium to the University, and on the other by the *Real Schule* to the Polytechnic, there exists an infinite variety of special schools for weaving, for dyeing, for building, for mining, for clock-making, for wood-carving, for metal work, for pottery, and for art in application to other local manufactures. In parts of Switzerland the Cantonal Budget applies to education nearly one-third of the whole revenue, while the towns sustain the primary schools with great liberality. We hear much of the enormous expenditure on the military system of Germany, and it is truly large. But in some of the German States the aggregate expenditure on education will bear comparison with their quota of the German war tax. Last year the City and Guilds of London Institute published a most valuable work which ought to have been read with great interest in Nottingham, because it describes with great force as well as minuteness the system of education in a Saxon town of 90,000 population, which appears to have successfully competed with this district in one of its long-established staple trades; and because, further, it is written by a gentleman who, although now engaged in business at Chemnitz, earnestly desires the welfare of his native town of Nottingham. Mr. Felkin describes the provision for general instruction as having been provided at a cost for buildings of 153,000*l*., while the technical school buildings have cost 88,000*l*. The cost of maintenance may be imagined when it is seen that 363 teachers are employed, and that the fees are so low that they are no impediment to the poorest pupils. The State technical institutions and the higher weaving school there, as well as the hosiery school at Limbach close by, have beyond doubt had an enormous influence in advancing the prosperity of Chemnitz, and the recommendations which Mr. Felkin makes may well be pondered by all who are concerned in the maintenance of the industrial supremacy of our own country. I cannot leave this subject without felicitating the inhabitants of Nottingham on the efforts which they have made in the right direction, and upon the valuable assistance which they have received of 500*l*. a year through the agency of the City and Guilds of London Institute from the Drapers' Company, which I am told now subscribes 4,500*l*. a year in aiding that valuable organisation to stimulate local efforts of the description which are now being made in connexion with Nottingham College. The estimate of what is being done in other countries would be very incomplete without some reference to the influence which is exerted by the museums in which, in addition to the examples of general, artistic, or antiquarian interest, there are generally good collections of machines and models of mechanical appliances. There are also often preserved specimens of the manufactures of all countries and periods which can be supposed to be of interest to the local producer, which are carefully classified and made easily accessible to all persons concerned. At Carlsruhe, and at Nuremburg too, at this moment there are exhibited illustrations of the extent to which the teaching in the schools of design is applied by manufacturers, and which afford very convincing evidence of the essentially-practical character of that teaching, and of the familiarity of the teachers with the requirements of the local trades. In bringing this paper to a conclusion, I feel a certain sensation of regret that so much of it has apparently been devoted to considerations which may seem to appeal to merely mercenary motives. I trust, however, I shall not be misunderstood. The commercial and manufacturing supremacy of England is as essential to the influence it exercises as a great governing and civilising power as it is to the continued welfare of its own population. The stranger who visits the professional school at Rouen will find a cabinet of objects, in the centre of which is a Prussian helmet; and he will be told that this relic of the invasion of ten years ago is preserved as a reminder of the humiliation which was brought upon France by its neglect of the education which gave the Germans their superiority in war. The rapid and triumphant march of events in Egypt during the last few weeks has shown how accurately to-day we may speak of the art of war. And so in arms, in arts, in commerce, as in all the important engagements of life, bearing our part, as we are called upon to do, in a world which is ever moving at an accelerated pace, the very condition of existence is that we should adapt our institutions to the progressive condition of things, and this will we do, conscious that the effort it involves will only strengthen our sinews for any strain they may be called upon to bear in the future that is before us.

BRYNCRÛG CHURCH.

A memorial church to the late Mr. Wynne, F.S.A., of Peniarth, has just been completed at Brynerûg, near Towyn, Merionethshire, from the designs of Mr. B. Edmund Ferrey, carried out by Mr. Richard Morgan, builder, of Brynerûg. In plan, it consists of a nave, 36 ft. by 20 ft. 3 in. broad, with south porch; and a chancel, 19 ft. by 15 ft. 9 in. An archway on the north side of the latter opens out into a small vestry, screened off. At the west end is a massive bell-gable. The walls are built of a beautiful grey-coloured syenite, with Ruabon stone for the dressings. The roofs are covered with a local bluish-grey slate, with red ridge tiles. The nave has an open pitch-pine roof, with ornamental moulded trusses at intervals; and the chancel a panelled ceiling of the same wood, with carved cresting to the cornice. The nave is supplied with plain open pitch-pine benches, and English oak seats and prayer-desks to the chancel of a more ornamental character. The pulpit is of English oak, with perforated panels, standing on a base of Shropshire red sandstone. The paving is of Godwin's tiles, arranged in patterns by the architect. The font is of Ruabon stone. The windows are glazed with quarry cathedral and clear white glass, in various ornamental devices. The heating apparatus is on the system of Porritt, of Bolton.

SALES OF BUILDING LAND.

Last week Messrs. Baker & Sons submitted for sale, at the Stag Inn, South Acton, the third portion of the Beaumont Park Estate, at South Acton, belonging to the National Liberal Land Company. The plots offered were seventy-five in number, some of them containing frontages of 16 ft., and others of 18 ft., with depths ranging from 64 ft. to 133 ft. There was a numerous attendance at the sale, and sixty out of the seventy-five plots offered were sold. The plots having 16 ft. frontages and 64 ft. in depth realised prices averaging 52*l.* each; those having frontages of 18 ft., with a depth of 120 ft., were sold for from 66*l.* to 70*l.* each; whilst the plots having a depth of 133 ft. realised 90*l.* each. The total proceeds of the sale amounted to about 3,200*l.*

Mr. Richard J. Collier also last week offered for sale a freehold building estate at Hendon. The property is situated close to the Hendon Station on the Midland Railway, and within a few minutes' walk of the Welsh Harp. The plots were described as having frontages to Edgware-road and the several new roads leading there from, and the estate was described as offering attractive sites for the erection of small residences, for which there is a great demand in the locality. The number of plots submitted was sixty-one, of which forty-two were sold, thirty-four of them having frontages of 17 ft. and a depth of from 80 ft. to 90 ft., realising prices ranging from 54*l.* to 66*l.* each. Four shop plots, with frontages of 19 ft. and a depth of 86 ft., were sold for 100*l.* each, and four other shop plots, containing a similar area, realised 90*l.* each. The entire proceeds of the sale amounted to 3,406*l.*

ST. JOHN'S CHURCH, DÜSSELDORF.

The new Church of St. John, Düsseldorf, of which we give an exterior view in our present issue, has been the outcome of long-continued efforts on the part of the Evangelical community of the town. So long ago as 1855 the nucleus of the building fund was formed, and twenty years later, in 1875, the building site was acquired. But the foundation-stone was laid the same year, and the church, of which Herren Kyllmann & Heyden, of Berlin, are the architects, was recently opened for public service. The style chosen by them is a blending of Gothic features with Italian Renaissance, the most striking characteristic of the building being the very elegant steeple. The exterior of the church needs no description, being well represented in our engraving. On entering the building by the vestibule under the tower, the view is a very fine one, a most striking impression being produced by the ample flow of light coming in through the broad windows. The high arches are semicircular; the ceilings, pillars, and walls are decorated by dull colouring. In the centre of the apse, which is somewhat higher than the floor of the nave, the altar, of black marble, and surrounded by a gallery in white marble, is placed. The pulpit has been placed in the nave, to the right of the altar, at the principal pillar of the intersection. The organ, flanked by the choirs, fills the whole width of the nave. Its builder is Herr E. F. Walter, of Ludwigsburg. Generous donors have provided the altar, pulpit, painted windows, a set of bells, the tower clock, &c.

NEW BRANCH BANK AT LEEK FOR THE MANCHESTER AND LIVERPOOL DISTRICT BANKING CO., LIMITED.

These buildings are now approaching completion. They occupy an important site in Derby-street, the main thoroughfare of the town, and closely adjoin the old Roebuck Hotel, an interesting bit of "black and white." The frontage of the new premises, which include a commodious house for the manager, is about 80 ft. The materials used in construction are thin dark-fired red Ladderedge bricks, with pink Roche stone dressings: the exposed timber framing and cornices, and doors and windows to the street, are of teak; the decorations in the gables are modelled in Portland cement; Broseley tiling is used for the roofs; and the windows in the main are glazed with patent plate in lead quarries. The portico has a high dado of Burmantofts thin glazed russet bricks, Roche stone dressings, and a frieze of Mr. de Morgan's tiles.

The length of the banking-room, each end of which is segmental in plan, is 48 ft.; its width, 24 ft.; and its height 15 ft. In view of the cost and great inconvenience to business of periodical renovation, this room is finished throughout in durable material which will not require it. The walls, arcaded, have bands of St. Sylvester marble and white marble concrete, with the moulded parts in scagliola to match the St. Sylvester. The fireplaces are furnished with dog-grates in tiled recesses, with Dove marble chimneypieces in harmony with the rest of the interior. American walnut is used for the wainscoting of the walls, the doors, and the counters and desks, which are made to the architects' designs. The panelled ceiling is of American whitewood and walnut and old-seasoned pitch-pine: it is fixed under a fire-proof concrete and iron flat, which carries the leads.

A short corridor from this room gives access to the consulting-room and the large cast-iron strong-room. In the basement there is ample accommodation for storage.

The works are being carried out in a substantial and satisfactory manner under the direction of the architects, Messrs. William Sugden & Son, Leek. The builders are Messrs. Isaac Massey & Son, of Alderley Edge; the sub-contractor for the brickwork is Mr. Broadhurst; for the stone-masonry, Mr. Leadbeater; and for the plumbing, &c., Mr. Edwin Phillips, of Leek. The heating (by warmed air) has been entrusted to Messrs. Haden, of Manchester, and in conjunction with them a scheme of general ventilation has been arranged. Mr. Roddis, of Birmingham, and Mr. Millson, of Manchester, are carving the wood and stone; and Messrs. Collinson & Lock are modelling the decorative plaster-work,—all to full detail drawings by the architects.

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY COMPETITION.

We illustrate this week the design submitted in this competition by Mr. H. H. Bridgman, architect, of 42, Poultry.

It consists of a block of buildings extending nearly the whole length of the site (which fronts the sea immediately opposite the pier), a length of 198 ft., and on an average 28 ft. deep, with the exception of two projected portions, which take up the limited building line, and is five stories in height, the lower story being sunk about 4 ft. only below the Parade level. The 24 ft. wards, with cross ventilation, have been adopted for all wards of more than three patients, without exception. The general arrangement of the building is: administrative department and children in the centre, men left, and women right. There are two staircases, with an ambulance lift within each. The kitchen, stores, and servants' rooms are in the rear, and nurses' dormitories on the top. Two airing-yards, 40 ft. by 30 ft. each, clear space, are arranged for in the rear, giving a compact whole, airy and well lighted, and ensuring perfect classification and facility of administration.

The basement or sub-ground floor is approached by a short flight of six steps, and contains in the front centre the out-patients' waiting-hall, 48 ft. by 28 ft. 6 in., entered from the open areas, and seated to accommodate eighty patients, with physicians' and surgeons' rooms, &c., on either side, the dispensary being in the middle, adjoining the waiting-hall. The medicines are sent up to the various wards by light lifts. The two ends of this story contain wards for male and female contagious cases, four of each sex, with day-room, nurse's room, bath, water-closets, &c., attached. These wards have no communication whatever with the interior of the building, but are quite isolated, and entered from the outside. 6 ft. in height of this story being above the street level, perfect through ventilation is secured. In the rear extreme corner at one end, and detached, are provided the mortuary, *post-mortem*, and ambulance rooms, whilst in the opposite back corner, also detached, are the workshop, coffin-store, and disinfecting house. From each staircase there is an approach to the kitchen apartments, and the staircase lifts are used at meal-times for speedily supplying the various wards with food. The kitchen is 32 ft. by 20 ft., and 19 ft. high, lighted on two sides, and having two skylights for carrying off the heat and steam. On one side of the kitchen are placed the larder, pantry, and wash-up room, and on the other side the general scullery, bread-room, and china-stores; the coal-stores, water-closets, &c., and ovens, projecting from the kitchen, being placed under the footpath of the back road. The large open spaces above referred to ensure ample air space all round. In a mezzanine story over the side rooms are the general store-rooms of the infirmary.

The ground-floor is 6 ft. above the Parade level, and approached by a flight of steps and through the principal entrance and hall. Immediately opposite the entrance, the operating-room, 22 ft. by 18 ft., is entered; the casualty-rooms, surgeon's appliances room, &c., adjoin. In the front, on one side of the entrance, are the committee-room, &c., and on the other side the office and surgeon's house, whilst the ends of this floor are occupied by accident wards, ten and eight of each sex, with nurses' rooms, baths, waterclosets, &c, the latter projecting at the ends. From the staircases on this floor is approached the nurses' general dining-room, immediately over the kitchen, and which is supplied by small lifts direct. On this level also are all the male and female servants' bedrooms.

The centre portion of the first floor contains twelve children, six of each sex, with a nurses' room; bath and waterclosets (built out) adjoin for each. The ends of this floor are occupied by two general wards, ten and eight of each sex, with nurses' rooms, baths, and waterclosets, as below; whilst two convalescent wards, 24 ft. by 16 ft., for each sex, occupy the projections.

The second floor contains, in the centre, special wards for six men and six women, with nurses' rooms, baths, and waterclosets, as before. The ends are used as general wards, eight of each sex, and the arrangement below is repeated, excepting that on the men's side there is also a separate ward for two, whilst on the women's side are the matron's rooms.

The third floor is a repetition of the second floor, excepting that the eye wards are on this floor, and the centre portion is taken up with nurses' dormitories.

It will thus be seen that every section overlooks the sea, balconies being provided on all floors to enable the patients, when convalescent, to enjoy the full benefit of the sea air. Each section, without exception, has its own nurses' room, baths, and waterclosets. The latter are in all cases built out and cut off by an intervening lobby, and are adjacent to their respective wards. The staircases pass up close to the ward doors, and the lifts within them extend to every story. The contagious cases are quite isolated. The out-door patients have no communication with the indoor, and the kitchen departments are apart, though easily controlled,—all being important points for consideration.

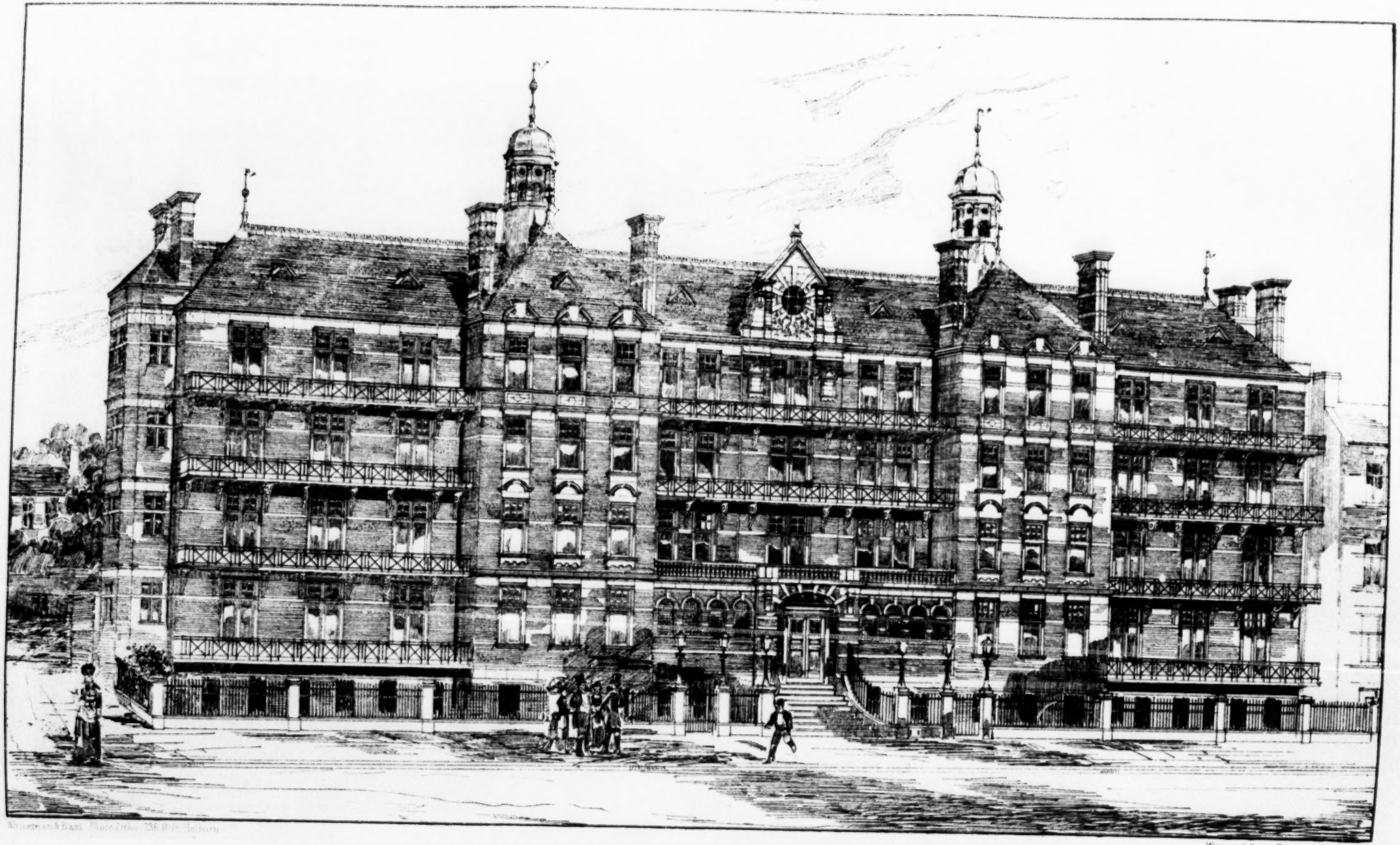
The principal elevation, which is a simple and free adaptation of Renaissance in red brick and stone, is broken up by two projections dividing the building into three bays, the roof being rather high-pitched, and at the intersections are two open turrets utilised as ventilators for the staircases, whilst there is a slight break in the centre, having an elliptic and rusticated arched entrance, supporting a balcony which runs the entire length between the projections. The centre is crowned with a pierced pediment resting on small fluted piers, with side scrolls and carved work. Balconies occur in all instances, except at the projections. The building itself is designed to accommodate 108 patients, at an estimated cost, including the allowed 10 per cent. margin, of 12,110*l.*, or about 112*l.* per patient.

NEW ROMAN CATHOLIC ORPHANAGE, HOMERTON.

This orphanage, of which view and plans are given, is for the reception of 120 Catholic girls from the workhouses, and is being erected at the expense of the "Sister Servants of the Sacred Heart of Jesus," a community whose services are devoted exclusively to the poor and sick, visiting and nursing them night and day at their own homes gratuitously without distinction of religion.

As shown by the plans, the new buildings for the children are attached to an old house which is used by the community for their convent, and which stands in about an acre of garden very advantageously situated, with frontages to Hassett and Ballance roads,—the general orphanage facing the latter, and the infirmary, separated by the convent, facing the former.

ST. JOHN'S CHURCH, DÜSSELDORF.—Herren Kyllmann and Heyden, Berlin, Architects.



Wyman & Sons, Printers, 74 Queen St.

EAST SUSSEX, HASTINGS, AND ST. LEONARDS INFIRMARY.—MR. H. H. BRIDEMAN'S DESIGN.

New
MANCHES
Limited

William S
AR

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New BRANCH BANK *Buildings at* LEEK *for the*
MANCHESTER and LIVERPOOL DISTRICT BANKING COMPANY
Limited

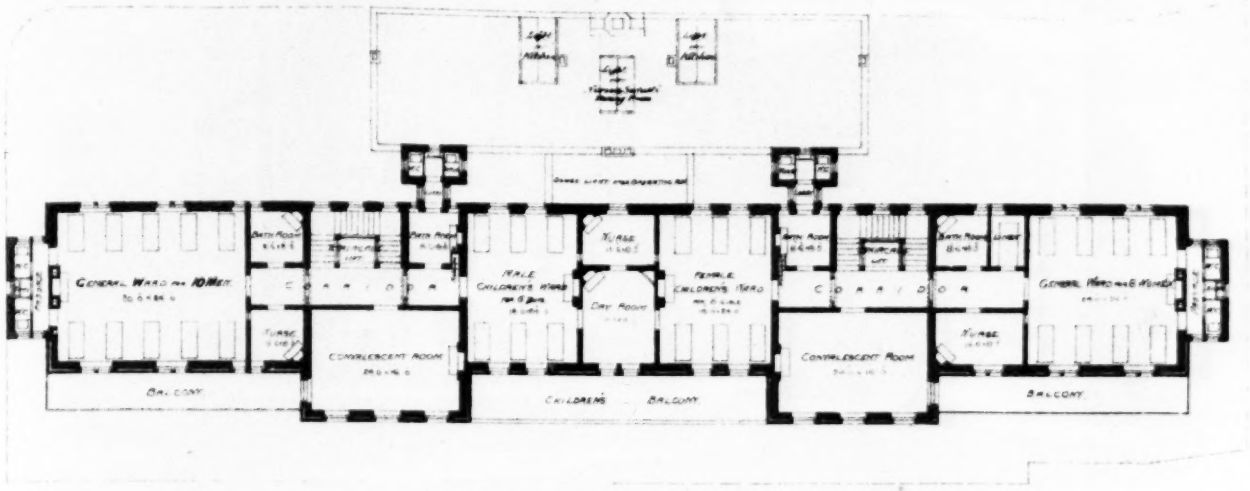
William Sugden & Son
ARCHITECTS

LEEK, JUNE 1882.

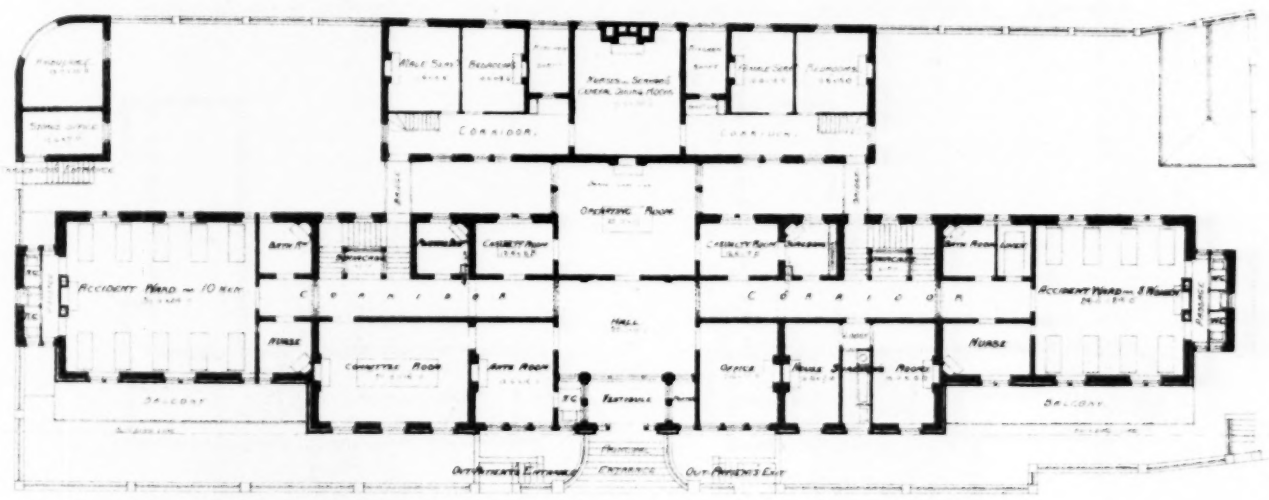
Wyman & Sons, Printers, 74 Queen St

EAST SUSSEX, HASTINGS, & ST. LEONARD'S INFIRMARY.

Mr H. H. BRIDGMAN'S DESIGN.

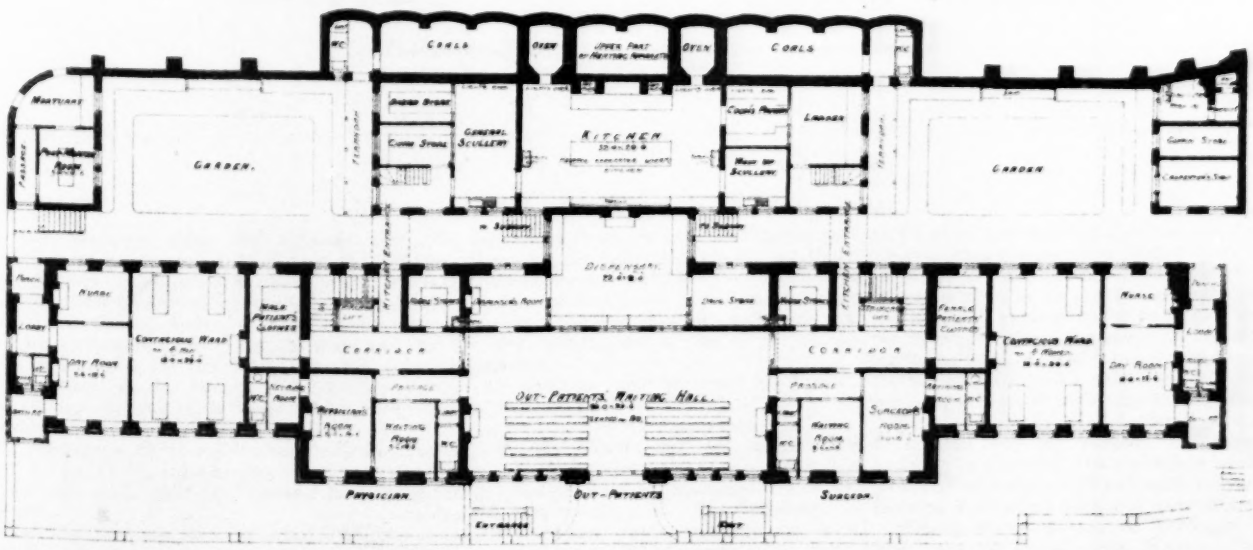


FIRST FLOOR PLAN



GROUND FLOOR PLAN

MEZZANINE OVER KITCHEN

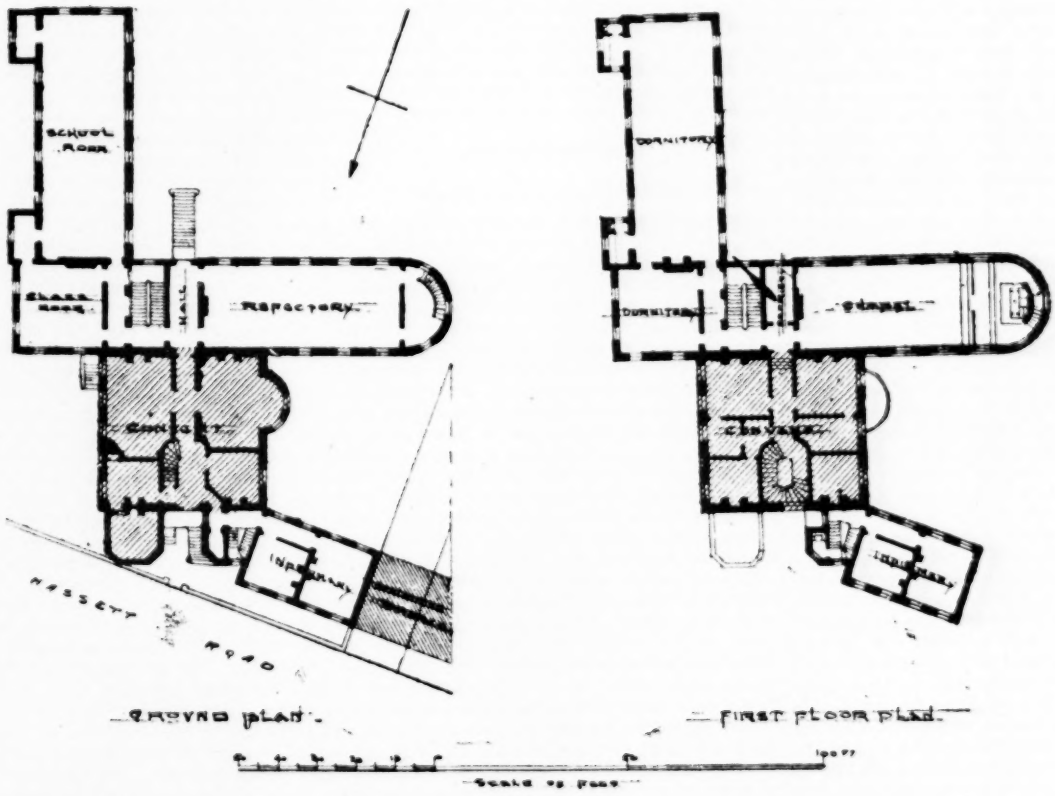


PLAN OF SUB-GROUND FLOOR.

Ansteman & Mann, Photo-Litho, 226 High Holborn

Wyman & Sons, Printers, 74 to 76 Great Queen St.

NEW ROMAN CATHOLIC ORPHANAGE, HOMERTON.—Mr. C. G. Wray, Architect.



On the basement floor, the children are provided with a play-room, 62 ft. by 21 ft., opening out into a play-ground, out of which is an inclosed water-closet yard, containing a range of sixteen of Bowes, Scott, & Read's patent self-clearing trough-closets. The lavatory and bath-room are also on this floor, the rest of which is taken up by the laundry, kitchen, larder, store-room and other usual offices. On the ground-floor is a school-room, 62 ft. by 21 ft., class-room 21 ft. square, and refectory also 62 ft. by 21 ft., with sewing-room in the apse at the end, and two rooms for the infirmary.

On the first floor are two dormitories of the size of the school and class rooms respectively, and a chapel of the size of the refectory, plus the apse at end, with a sacristy attached, and two rooms for the infirmary.

On the second floor are two dormitories and two rooms for the infirmary similar to those on the first floor; and the chapel, which extends to the height of two floors, is provided with an organ-gallery over the sacristy, and a gallery for the sick opening out of one of the rooms of the convent.

On the roof-floor are arranged convenient clothes, linen, and box rooms.

The school and class rooms are each provided with book-rooms, and the dormitories with night water-closets in an adjoining building, having exernal openings on three sides for free ventilation. The infirmary is also provided with water-closets on each floor similarly ventilated, and with bath-room and surgery, &c. The rest of the accommodation is devoted to the convent use.

The height of the rooms throughout is 12 ft., and besides the windows they are ventilated by Sherringham's ventilators placed between the windows in each wall. The interior of the chapel is 26 ft. in height to the wall-plate, and has a quasi hammer-beam roof with moulded brackets springing from stone corbels, the ceiling being lined with V-jointed matchboarding, and formed into panels with moulded ribs. The windows are glazed with cathedral glass in tints.

The elevation has been made of plain design to accord with the purpose for which the building is intended, the materials used being picked stock bricks with red brick bands for the facings, York stone sills, and slate roofs.

Messrs. Perry & Co., of Tredegar Works, Bow, are the contractors, Messrs. Fraser & Fraser, of Bromley-by-Bow, supplying the laundry, baths, and lavatory fittings. Mr. C. G. Wray, of London, is the architect.

RECENT SANITARY WORK AT NEWCASTLE-ON-TYNE.

From a paper read at the congress of the Sanitary Institute by Dr. H. E. Armstrong, Medical Officer of Health, on the sanitary history of the town, we take the following:—

By the Newcastle Improvement Act, 1865, the Corporation obtained various sanitary powers, which, since that time, have not been allowed to lie dormant. Two years after the passing of the Act, several important sanitary reports were presented to the Town Council. From one of these,—the work of a committee under the presidency of Ald. Wilson, the chairman of the present Sanitary Committee,—it is evident that energetic action was then taken to put in force the different provisions ob ained for the protection of the public health. Thus,—under the powers enabling the Corporation to raise in advance the moneys required for paving, sewerage, &c., a large number of previously defective streets were put in good order; the sanitary staff was permanently increased; active steps were taken to prevent overcrowding; upwards of 500 unhealthy dwellings were closed in less than two years, and to meet the difficulty of the persons removed from their homes, rooms were provided elsewhere by the committee; about a tenth of the most unhealthy of the dwellings before mentioned were purchased and pulled down; a temporary hospital, in anticipation of cholera, was erected on the town-moor, and a disused chapel in Forster-street, fitted up with beds for the same purpose, was soon afterwards successfully employed for the reception of cases of scarlet fever. A large special staff was also organised and engaged for a considerable period under the extensive provisions of the Sanitary Act of 1866, the town being divided into districts for the purpose. The ashpits, previously cleansed at the expense of the owners, were now cleansed out of the rates; vigorous measures were taken to purify tenement and other property, &c. The report shows that, at that time, upwards of 23,000 rooms, representing the dwellings of 55,000 persons, or half the population, were inspected, of which one-eighth were found to be without the means of good ventilation; the same proportion were without water; one-fifth were without privy accommodation; two-thirds only of the houses had good drainage, and one-eighth had none at all; nearly 8,000 persons lived in rooms yielding less than 300 cubic feet per person. The committee, among other conclusions, expressed their conviction that, for the cure of many of the sanitary evils of habitations of the lower classes, one remedy only would be effectual, the provision of other accommodation, the opening out of thoroughfares, and the demolition of habitations incapable of being put into proper sanitary condition. This opinion was given eight years before the passing of the Artisans and Labourers' Dwellings Act of 1875, of which it is the foreshadow. At the time of the report referred to, the annual death-rate of Newcastle was 32·3 per 1,000. It has since fallen gradually to 21·7 last year. Five years after this saw the birth of the Public Health Act of 1872, and in the following year, Newcastle, in common with other urban and rural districts throughout the country, had a medical officer of health. Of the doings of this functionary it becomes not me to speak. The proceedings, since his appointment, for the improvement of the dwellings of the poor, the prevention of disease and the sanitary benefit of the inhabitants in general,—are they not written in his nine annual reports? Among matters of importance in relation to the hygienic condition of Newcastle of to-day, not the least is the amount of recreation-ground open to the public. Including the Town Moor and Leazes (lands in grass, but not laid out ornamentally), and the Armstrong, Brandling, Elswick, and Leazes ornamental parks,—the exercise-ground to which the inhabitants have right of free access comprises a total area of 1,268 acres, being almost one-fourth of the entire city, and at the rate of one acre to every 114 persons,—an amount probably unequalled in any other large city or town. An official representation under the Artisans and Labourers' Dwellings Improvement Act, 1875, was made to the Corporation as the Local Authority in 1876. The areas specified in the representation were those of the New and Old Pandon Groups, the former of which has already been referred to. In support of this representation, the sanitary committee recommended the purchase of the property of the New Pandon Group, at a cost of 26,000*l*., for demolition of the houses thereon, and the erection of new dwellings elsewhere. The buildings were ultimately acquired and demolished under the provisions of a local Act, and, as already stated, the hollow in which they stood is now filled up. A large proportion of the property in the Old Pandon Group has also been dealt with under the same power. Since the passing of the Newcastle-upon-Tyne Improvement Act, 1865, the cost of the different sanitary works executed by the borough engineer has amounted to upwards of half a million sterling, and included the following:—

Sewering	£74,583
Flagging and paving	172,370
Street watering	14,349
Scavenging	102,839
Ashpit cleansing	104,460
Other sanitary works	52,895
Total	£521,496

The powers with respect to the notification of infectious diseases and other sanitary matters,—acquired by the Corporation under the Improvement Act of the present year,—are fresh in the memory of this Association. The necessity for the provision of a new sanitary hospital to meet the requirements of this populous city, in place of our ancient fever house, has for years been strongly represented by the Sanitary Committee, and, in the abstract, is pretty generally admitted by all. But the mere indication of a *site* for such a purpose,—and many sites have, one after another, been proposed,—has invariably met with very great opposition. Dr. Armstrong concluded by remarking that the reduction of the yearly death-rate per 1,000 of the population by ten in as many years, and the diminution of typhus in the same time to one-fifth its prevalence in the corresponding period immediately before, are tangible results of their more than Herculean labours.

PLANS AND PLANNING.

This was the subject of the public introductory lecture (delivered on Wednesday evening last) to Professor Roger Smith's courses at University College (Session 1882-83) on Architecture, Construction, and Modern Practice. Planning, the lecturer observed, was one of the radical elements,—he might almost say the foundation-stone,—of all architecture. A plan was a map of a building as it would appear if everything above a certain level were removed. In other words, it represented the floor of the building, and, to a certain extent, the walls and the openings therein. The plan of the principal floor was the most important drawing made when the drawings for a building about to be erected were prepared, for upon it the success of the building mainly depended, not only as to matters of contrivance, but in regard to architectural effect. All buildings, reduced to their simplest elements, contained never more than six, sometimes only four parts. The floor, walls, roof, and openings were the four essentials of every building. If to these were added columns and ornaments, there were thus found to be six elementary groups of things, all or some of which went to make up every building. Although the plan was mainly intended to represent or map out the floor of a building, it also represented, as he had said, the walls and the openings, and at the same time indicated, to those who knew how to read it, the method of roofing. It was so seldom that opportunity offered for thinking out the nature of things that many young architects who were engaged on plans believed themselves to be occupied in arranging the walls of the buildings, whereas they were really arranging the floor,—a work which, although the least recognised, was perhaps the most important which the architect had to perform, inasmuch as it involved the disposition of the site to the best advantage. The first attempt to group or classify plans would show that they were comprised in two great main classes or divisions, which, for want of better terminology, he should distinguish as single and complex plans. What he called single plans were those of buildings which consisted in the main of one interior bounded on all sides by the external walls. On the other hand, what he designated as complex plans were those of buildings which consisted of a number of separate parts welded together into one whole. The single plan, then, was one with an undivided floor, while the complex plan was one in which the floor was divided into several spaces. Buildings with single plans were, and always had been, those which possessed the highest merit as works of architecture: hence St. Paul's and Westminster Abbey claimed higher rank than the Bank of England or the Houses of Parliament. The greatest buildings of the world were those which were planned as single structures. The Egyptian and Assyrian temples were illustrations of complex planning, those buildings being made up of a number of parts; but when we came to the Greeks, — the greatest of all architects, and the foremost of all artists, — we found that their great buildings were almost all single in plan, and very simple. As a work of architectural art the Greek temple took the highest rank. The Romans erected buildings which were both single and complex in plan, but judging of their works from what remained, we justly regarded the Pantheon and the Colisseum,—both single plan buildings,—as the finest specimens of Roman architecture. The Parthenon at Athens might be taken as a typical example of the great series of temples erected by the Greeks and Greek colonists. Here we had a floor space of very moderate size, divided into two chambers, in the larger of which the figure of the goddess was placed. These chambers were enclosed by massive walls, and there were indications of internal columns. The peristyle, extended at each end so as to form a deep portico, and the stylobate, extending all round the building, were elements of grandeur in the plan The exterior of the temple was most carefully studied and richly adorned. We were, for the most part, ignorant of what the appearance of the interior must have been, but however beautiful or highly decorated, there was little reason to suppose that it was at all so powerfully impressive as the exterior. A noteworthy feature in the plan of the temple was the absence of openings, which led to the inference that the temple was lighted from the top, an inference supported by the presence of the interior columns referred to. The absence of outward thrust by the roof was indicated by the disposition of the columns of the peristyle in relation to each other; these were among other points clearly indicated by the plan. The Pantheon at Rome afforded another notable instance of a single plan. Even were the vast dome of the building non-existent, the great thickness of the walls, and the absence of columns in the interior, would indicate the method of roofing, while the absence of openings in the walls would suggest that the interior was lighted from above. The ground-plan of Westminster Abbey, or of any other great Christian church, afforded another type of single plan, in striking contrast to that of the Pantheon. The clustered pier-shafts, with buttresses to the walls opposite them, would, in the absence of the roof, indicate to the architect, or to any one able to read a plan, that the roof was vaulted. The apsidal east end would show him how that part of the building had been influenced by French examples. The large amount of window-space in Henry VII.'s Chapel would indicate that the architect was desirous of obtaining as much space as possible for stained glass. Westminster Abbey was a single instance, but a very perfect one, of the planning of Gothic churches of large size. Another group of single plans comprised those which characterised the Christian churches of the Greek or Eastern communion, and of which Sta. Sophia at Constantinople and St. Mark's at Venice were well-known typical examples. In these plans the aim had been to get a large central space roofed in by a dome, surrounded by a number of smaller spaces roofed by smaller domes. Suggested by these plans were those of St. Peter's at Rome, our own St. Paul's as carried out by Wren, and Wren's first plan for St. Paul's. Wren appeared to have attached great importance to securing uninterrupted vistas along the nave and choir aisles across the transepts, and in order to do this he had to plant his dome on eight piers. In St. Peter's at Rome the dome was carried on four very massive piers only, but these piers had necessarily to be so placed as to destroy the aisle vistas across the transepts. Although this was to some extent a disadvantage, it was, perhaps, preferable to the method adopted by Wren, who seemed to carry his idea too far. Had he followed the same course as that pursued in St. Peter's, the nave of our metropolitan cathedral would not have that appearance of narrowness and crampedness, in propor-

tion to the rest of the building, which was noticeable. Passing to the consideration of specimens of complex planning, Professor Smith instanced the plan of the Egyptian temples, specially mentioning and describing that at Carnac, the Assyrian palaces explored by Layard and others, the Baths of Caracalla at Rome, and, as a typical Roman dwelling, the so-called house of Pansa at Pompeii. When civilisation was thrown back by the destruction of the Roman empire, the need for complexly-planned buildings did not assert itself for a long time, but gradually the wants of the great monastic houses, and the requirements of the occupants of castles and palaces, led to a development of complex planning which had been carried on through the seventeenth and eighteenth centuries down to the present time with continually increasing demands on the skill of the architect. For Wren must be claimed merit of a high order for plans of domestic buildings, such as Chelsea and Greenwich Hospitals, and still more so for the Palace at Whitehall, of which the Banqueting Hall,—now the Chapel Royal,—was the only portion built. The planning of our ordinary dwelling-houses was necessarily complex, the problem being to provide for continually-varying requirements on sites which, especially in towns, were usually restricted in size and aspect, and very often irregular in shape. The disposition of an adequate staircase in the least possible space was one very important test of skill in house-planning, but this was a kind of skill in which modern French architects excelled. The skill in planning shown by Sir Charles Barry, Mr. E. M. Barry, Mr. Street, and Mr. Waterhouse having been remarked upon, and reference made to the plans of the great public and municipal buildings erected by those distinguished architects, the lecturer referred to the skill in domestic planning shown by the late Mr. George Somers Clarke. Modern requirements, he went on to point out, had created many occasions for the architect to distinguish himself by ingenuity and contrivance in planning the various institutions, schools, colleges, &c., which had been erected and were being erected on all hands. In some of these public and semi-public buildings, such as prisons, workhouses, &c., and in private buildings, such as factories, warehouses, &c., there would at first sight appear to be little scope for studying anything but utility, but, although in many such buildings ingenuity in planning had been divorced from artistic treatment, there were many others in which the two were combined. There was no royal road to planning. Success in it was only to be obtained by repeated efforts. No man was by nature a good hand at a plan. It was essentially an artificial accomplishment, which, like swimming or riding a bicycle, had to be acquired. In conclusion, the lecturer urged his hearers to endeavour to form a proper estimate of the value to an architect of the power to plan. There was, indeed, little danger of exaggerating the value of the plan as an element in architectural design, for it was impossible to arrive at a good design in any other way than by making a good plan. As he had said at the outset, the plan was the foundation of every architectural design, hence the necessity that the architect should take thought to make the plan a good one. The effect of the superstructure would depend upon his knowledge in acquiring architectural details, and upon his success in properly using them.

THE DRAINAGE AT FRANKFORT.

SIR,—The description of the drainage of Frankfort-on-the-Main, which appeared in your issue of September 23 [p. 388], would, I have no doubt, be interesting to many of your readers, but to some of them it would, I imagine, seem strange that no mention was made of my name in connexion with it. The facts used in the article are taken from the report of Mr. Lindley, of May, 1877, and if the author of the article had translated the introductory paragraph to the statistics he has used on page 2 of the report (copy of which I enclose herewith) it would not have been necessary for me to trouble you with any explanation. I have no wish to enter into any controversy, and would have preferred asking the writer of the article to correct the omission, of which, from a want of knowledge of the full history of the works in question, he has probably unintentionally been guilty. The Commission alluded to in the article consisted of four engineers, namely, Messrs. Blonden, Eichberg, Lindley, and Wiebe, and the eminent sanitarian, Dr. Varrentrapp, their report being in favour of a system of sewerage, the leading features of which were entirely different to those of the scheme which had been prepared by the city engineer of that date, Mr. Eckhardt. Two years later, Mr. Lindley, sen., was asked to undertake the chief or consulting engineership of the work, which he did, on the condition that an acting engineer was appointed to work out the proposed scheme in detail. I was appointed to that position, and Mr. Lindley and myself entered into separate agreements with the Senate of Frankfort on January 5th, 1866, at equal salaries of 600*l.* each, Mr. Lindley undertaking to visit Frankfort two or three times a year, while my duties were to work out the scheme and correspond with him thereon, as occasion required. An office was established, and I entered upon the duties in the following April, supported by able German assistants, placed at my disposal by the authorities.

General plans, sections, and details were proceeded with as rapidly as possible, and contracts issued for materials, it having been determined to provide these for contractors undertaking the execution of the works. Details were published for all ironwork, stoneware, and other articles required, and subsequently drawings showing generally the character of the details of the works, all of which will be found to be signed by Mr. Lindley and myself, and are well known by many eminent engineers in this country, as well as on the Continent. Advertisements were issued from time to time in your valuable paper, inviting tenders, and a reference to them will bear out what I am now stating.

In 1868 I drafted regulations for the private drainage, which embraced some suggestions of Mr. Lindley's, and had, at the request of the magistrates, owing to the strong opposition met with on the part of local builders, eight sheets of drawings prepared to illustrate more precisely what was required. These regulations and details, which I was anxious to make as perfect as possible according to the ideas I then entertained (but which I had not been able to fully carry out in England), were approved by Mr. Lindley and published by the authorities, bearing his signature and mine, and have not been substituted by any other that I am aware of, up to the present time, except that the Town Council have modified their stringency on one or two points,—notably in reference to the original requirement of extra trapping of house-drains outside the house, and utilising of the whole of the available fall.

One of the first things I thought desirable when the works were commenced was the continuous testing of the cement (alluded to by your contributor) as being most important and necessary where it had been determined to build all brickwork with that material. As Mr. Grant had done in London, so the testing under my directions (for which a man was specially appointed, and did nothing else) led the way to the general testing of this material, now so prevalent, well regulated, and scientifically carried on all over Germany.

In the beginning of 1869 I prepared a statement of the cost of the works executed and an estimate of the cost of those remaining to be carried out, showing a total expenditure amounting to 330,000*l.* for the whole scheme, and this was aproved in February by Mr. Lindley, then, if I remember rightly, in Pesth, and submitted to and sanctioned by the Board of Works and the Town Council in the following June, and will be found signed by Mr. Lindley and myself in No. 16, volume ii., of the published Proceedings of the Town Council for 1869.

There was no such firm as Messrs. Lindley at that time, the sons now practising as a firm being then much too young, not having, in fact, I believe, left school when these works were commenced. I have not the remotest intention that anything I may say should be construed to detract from the position which Mr. Lindley's sons have since so rapidly attained, but think that it is exceedingly unfair that a work on which I spent the best years of my life with a devotion and determination to make it what it is acknowledged to be by all who have had the opportunity of seeing and studying it, should be accredited entirely to those who are only entitled to a share of whatever credit is due to its authors.

I retired from the works in October, 1873, after having devoted seven years and a half thereto, and the most difficult of them were completed under my immediate directions at a cost, up to that period, of 172,000*l.* Mr. Lindley retained the chief engineership, while Mr. Hallenstein, now carrying out the works I designed for Munich, and who had been engaged on the Frankfort works from the commencement, remained as chief of the office-staff. Mr. Lindley's eldest son then entered the office, and subsequently, on the retirement of his father, about two years and a half ago, succeeded to the chief control, and continues to carry on the works on the old lines, and to extend them as the rapid increase of the city requires it.

This, I believe, is something like the true history of the engineership of these now well-known works, and I cannot but suppose that neither Mr. Lindley, senior, nor his sons, who are now also occupied with other works on the Continent, would wish to ignore the part I took in connexion with them.

I could have wished to say something about the works themselves, but must defer that to some future occasion or other opportunity; at the same time I quite expect that, if the description of them as given in the *Builder* is carefully looked into by English sanitarians, they will be inclined to criticise two points on which the works differ so widely from English works of the present day, viz., that of the direct connexion of the house-drains and admittance of all rain-water. These two points alone open up a wide field of discussion, and I am afraid there would be little hope of an agreement of opinion on the Frankfort works in reference to them. I feel sure of one thing, however, that no works will be found to be better ventilated, this essential feature of all good sewerage systems having been carried far beyond anything I am acquainted with elsewhere; and I should very much doubt whether the same amount of control over the works of private drainage as has been exercised in Frankfort has been accomplished in other towns, except some few on the Continent which have taken the Frankfort regulations as their basis, namely, Düsseldorf, Crefeld, Stuttgart, Munich, and Dortmund, with the two first of which Mr. Lindley was connected as consulting engineer, and the writer in that capacity with the three latter.

J. GORDON, Mem. Inst. C.E.
Borough Surveyor, Leicester.

SIR,—After reading the admirable article in the *Builder* of September 23rd, I was very much disappointed that the author of it did not mention Mr. Gordon's name. I feel sure, if Mr. Lindley had been aware that the paper was going to be published, he would have insisted that Mr. Gordon's name should be coupled with his own, as it always has been in the published plans and papers connected with the undertaking.

During the construction of the Frankfort sewerage works, professional matters called me five times to Germany; and on three of my visits I passed through Frankfort, viz., in September and November, 1870, and in March, 1872, and I then had the pleasure of thoroughly examining the sewerage works.

Knowing Mr. Gordon as I do from the time he commenced his professional career, I can speak confidently of the ability and untiring energy which he has always thrown into any work he may have had in hand; and in no work he has ever undertaken did he display more ability and greater energy than on the Frankfort sewerage works.

Robin Hood, so the tale goes, would not have a man who could not in some points beat him, and the credit given to Robin Hood's men does not detract from his own fame.

I believe Mr. Lindley, whose name is so deservedly well known, will be as proud to see honour done to those with whom he has worked in perfecting this sewerage scheme.

H. U. MCKIE,
City Surveyor, Carlisle.

HASTINGS AND ST. LEONARD'S INFIRMARY COMPETITION.

SIR,—Will you allow me, through your columns, to request the competitors to favour me with their names preparatory to concerted action in regard to the above matter. I would especially request it of "Fair Play" and your other correspondent. Letters should be addressed to Box 001, Office of "The Builder."

A COMPETITOR.

FERNERY.

SIR,—Having built a fernery composed of a quantity of petrified marl, called "tufa," from Derbyshire, I am desirous of constructing some tanks of the same to hold fish. I have tried Portland cement, which cracks and gives way. Will any one suggest a means? Would clay puddling, and cement on top, do?

D.

BUILDING NOTES FROM THE WEST.

The Bristol General Hospital has just been closed for extensive alterations and repairs. The immediate cause of this step was the faulty arrangement of some of the drains connected with the institution, and a committee having been delegated to see what should be done, consulted Mr. Eassie, of London, who reported to them that, from a variety of causes, but chiefly from the direct communication of the drains with the public sewers without any ventilation, the house was full of sewer gas. He also pointed out that the water supply came from cisterns which were used for the purpose of flushing the closets, and expressed an opinion that from a sanitary point of view the building was in a dangerous condition. A thorough alteration of the drainage system was decided on, and an alteration in the mode of supplying the house with water. This necessitated closing the hospital, and it was determined at the same time to improve the ventilation of the wards, and to lay the floors with wood instead of cement, as at present. On the latter point there was some time ago a great difference of opinion, and the faculty of the institution, who then had not votes on the Board of Trustees, strongly opposed the use of cement for flooring. In part of the house, however, cement was laid down, and the committee, on which the medical staff have since been given votes, decided, though not unanimously, to lay the whole of the flooring of wood specially prepared with paraffin. Other smaller items are also to be attended to before the institution again opens its doors for the reception of patients. The estimated cost of the works is between 6,000*l.* and 7,000*l.* A member of the committee having called attention to the fact that the contract was to be given without tenders to a London contractor, the Bristol Master Builders' Association has entered a protest against this mode of procedure. The letter of the secretary to the Association said: "That a London contractor and his workmen should be appointed to do the work if he obtained it by fair competition would have provoked no feeling on the part of the tradesmen here, but what we do complain of is the fact that this appointment has been made without giving the tradesmen of Bristol the slightest chance of competing for the work, and this in the face of the knowledge the authorities must have that contributions and subscriptions, both from employers and workmen, form no mean part of the income of the institution."

At Bishopsworth parish church, in memory of the late Mr. Thos. Maynard a stained-glass window by Messrs. Wailes & Strang (Newcastle-on-Tyne), and a font by Mr. Frank Bell (College Green, Bristol), have just been erected. The subject of the window is the Crucifixion, and the treatment is that of elongated medallions on a rich mosaic ground, surmounted by a border of similar design. The font is of Norman design.

Messrs. Budgett's new business premises in Bridewell-street, Bristol, are lighted by electricity, supplied by the Great Western Electric Light and Power Company, Limited. This company has recently purchased premises in the centre of Bristol as the headquarters from which to supply electricity. Messrs. Budgett are their first customers, and when their order is carried out their premises will be illuminated by over a hundred Lane-Fox incandescent lamps and four 2,000-candle Brush lamps. At present, pending the fixing of the Lane-Fox apparatus, twenty or thirty of the arc lights are in use, and work very steadily.

The electric light at the new East Dock at Swansea is now in full work, and every evening when vessels can enter and leave the dock brightly illumines the entrance locks and basins. Five 2,000 candle-power Brush lamps are used, and are driven by a No. 5 Anglo-American dynamo machine fixed 400 yards off, the wires being taken underground. An eight horse-power engine supplies the driving-power.

The tender of Mr. W. Veales, 4,234*l.*, has been accepted by the Bristol Docks committee for the erection of sheds at Prince's wharf. The other tenders were Mr. A. J. Beavan, 4,262*l.*; Mr. Ressiter, 4,408*l.*; Messrs. R. & J. Davey, 4,549*l.*; Mr. Church, 4,561*l.*; Messrs. Lewis & Edbrooke, 4,568*l.*; Mr. G. Humphries, 4,574*l.*; Messrs. Stephens & Bastow, 4,593*l.*; Mr. Krauss, 4,713*l.*; Messrs. Howell, 4,722*l.*; Mr. Cowlin, 4,750*l.*; Messrs. Brock & Bruce, 4,766*l.*; Mr. Easterbrooke, 4,945*l.*; Mr. Walters, 4,965*l.*; and Mr. H. A. Forse, 5,040*l.*

It is stated that Mr. J. Lysaght, of the St. Vincent Ironworks, is about to erect spelter works near Bristol, thus reviving a once important but long absent industry.

Combe Down Church is about to be improved and enlarged at an expense of 2,000*l.* The proposed enlargement will consist of two aisles, a chancel, and chancel aisles, and it is also intended to reseat the church.

The new Church of St. Peter, Clifton Wood, Bristol, was opened on the 26th of September. The building takes the place of an old and inconvenient one close by. The style is Early Gothic, of a substantial character. The nave is 83 ft. 2 in. long by 39 ft. 7 in. wide; and the chancel, which has a circular apse, is 30 ft. 6 in. long by 27 ft. wide, the total length of the building being upwards of 113 ft. One of the aisles is 65 ft. 8 in. by 13 ft. 8 in., and the other 81 ft. 2 in. by 13 ft. 8 in. The tower, 20 ft. square, is 65 ft. in height, and has a handsome freestone turret. The walls are of Pennant stone, in random-range work, with Bath stone dressings for the windows and doors, and Draycot stone arches. A spire will be erected when funds permit. The nave and aisles are roofed with Broseley tiles. There are three entrances; the principal one, at the south end, (the site necessitated the church being built north and south), is a bold arch of Bath stone, heavily moulded, and enriched with handsome cuspings. On the east side of the chancel, to utilise a corner of the site, a chapel has been erected, which gives increased accommodation. On the other side, a corresponding wing is used as an organ-chamber, and both the chapel and organ-chamber open into the chancel with boldly-constructed arches of freestone. The nave and aisles are divided by four freestone arches, with handsome moulded caps and bases, and sanded Mansfield octagon piers. The building will accommodate 1,000 persons, and has cost about 8,000*l.* Mr. R. J. Crocker, of Bedminster, was the general contractor; Messrs. Bell & Sons had charge of the stained-glass windows; Mr. Frank Bell executed the carvings; Mr. Wood erected the pulpit; Mr. Singer, of Frome, the brass lectern; Messrs. Gardiner & Sons, Bristol, the heating apparatus; and Messrs. Priest & Son part of the ironwork. The architect was Mr. Vincent W. Voisey.

RUSSIAN NEWS.

About half-way down the Nevsky prospect, on the left hand as one turns one's back upon the Neva, is the fine Catherine-square, as those who have seen St. Petersburg will well remember. At the end opposite the Nevsky stands the Alexander Theatre, and the two other sides are faced respectively by the long façade of the public Library and by the Czarewitch Palace.

In the centre stands a fine bronze monument of Catherine II., and around and below the figure of the empress are grouped the celebrated persons whom she delighted to honour. At the corners of this square it has now been decided to erect statues of four prominent personages of this sovereign's reign, and models for these monuments are now being prepared in the St. Petersburg Academy of Arts.

Several of the Imperial palaces built by former sovereigns, but now never used by the Imperial family, are to be given up to public uses. One of these residences, built for Alexander I., at Taganrog, will be arranged to receive the town library and an interesting museum of local antiquities, which sadly needed housing.

Fires are unhappily at all times common enough in Russia; the magnitude of some of the recent ones, however, and the vast destruction of property which has resulted from them, seems to have awakened the attention both of inventors and of public bodies to the necessity of taking every measure possible to avert or diminish this evil, to which Russia is particularly subject. The local Council of the St. Petersburg Government have assigned a considerable sum for the establishment of model rural fire stations, upon the pattern of those founded by the Moscow Society of Rural Economy, and every effort is to be made to get the rural communes to adopt similar institutions.

The municipal authorities of St. Petersburg have issued an order which makes it compulsory upon the proprietors or lessees of all theatres, music-halls, and places of entertainment, to coat all side-scenes, curtains, properties, costumes, and other scenic accessories with the incombustible paint of MM. Spyeshnyef and Melgounof, or some similar composition. This is to be done within the period of six months from the publication of the order, and neglect of the precaution renders the delinquents liable to prosecution. It is added, in a mollificatory way, that now smoking in green-rooms and behind scenes will be free from danger, as burning cigar-ends, &c., cannot cause the iguition of materials covered with these preservative paints.

It is reported that a contract has been agreed to with an American firm to light all the theatres under Government management by electricity.

A recent number of the *Inzynierja i Budownictwo*,—a periodical devoted to engineering and construction, published in Warsaw,—contains a description and drawings of an automatic apparatus for extinguishing fire and signalling its outbreak, which has been invented by a mason, M. F. Balv. The apparatus begins to act automatically under the action of fire, and at the same time signals the fire at the fire-station with which it is in communication. The apparatus is comparatively simple in action, and does not require a very large quantity of water.

The cost of the new University about to be established at Tomsk is definitively estimated at 1,220,000 roubles. The requisite buildings will, it is considered, be completed by the year 1885.

It is anticipated that the whole of the scaffolding which has so long shrouded the Isaac Cathedral in St. Petersburg will, before long, be entirely cleared away, and the church exposed to view. The work of covering the walls with thick marble slabs is to be resumed next summer. The renovation of the large picture of the "Fall and Expulsion from Paradise" is already nearly completed. The mosaic decoration of the interior is said to be proceeding successfully. Eight pictures of saints are at present being treated in this way, and will probably be finished at no distant date.

With regard to the higher education of women, Russia has for many years been entitled to a high place among European nations. The higher courses for women in St. Petersburg, and those in Moscow initiated by the well-known Professor Guerier, justly enjoy a high reputation. A retrograde step has, indeed, been recently taken by the exclusion of female students from the higher medical courses in St. Petersburg. The organisation of a museum of the products of female labour is just now occupying attention in Moscow, and appears to have a fair chance of a successful issue. Many objects exposed in the national exhibition, which will close on October 13, will be devoted to this museum. Funds were left by the late M. Ponomaref for an analogous purpose; as, however, the testator committed suicide, the decision of a legal tribunal is awaited as to the disposition of the bequest.

Frequent attempts have been made to establish steam locomotion upon the ice which covers the Neva and a great part of the Gulf of Finland during winter. It cannot be said, however, that these efforts have hitherto been crowned with what may be regarded as anything like a secure and remunerative success. Last year indeed steam communication was established for a short period between Oranienbaum on the mainland on the southern side of the gulf and the island port of Kronstadt. Attempts, however, to employ the ordinary railway appliances upon the ice have proved more or less failures. Quite recently, M. Vradig has devised a kind of engine for use upon ice, by the employment of which metal rails may be dispensed with. M. Vradig has been negotiating with the St. Petersburg Town Council with a view to establishing his system of locomotion upon the Neva and its estuary during the ensuing winter. It is understood that the Prefect of Police has advised the Town Council that there is no objection to locomotion by steam upon the ice.

Ventilation.—Messrs. Robert Boyle & Son's system of ventilation has been selected by the Committee and Architect for the ventilation of "Lloyds," Royal Exchange, to which it is being at present applied. Messrs. Boyle's system is also being applied to Claremont, the residence of H.R.H. the Duke of Albany, and has been adopted for the ventilation of Portland Prison.

DAMAGE TO LEAD PIPES BY RATS.

In the cellar of a house in Berlin, a large number of rats had recently taken up their permanent abode. Notwithstanding traps and poison, the vermin could not be got rid of. The brickwork was carefully examined, and a good many holes were discovered, which probably served as nests for the rats or led to the outside soil. All the openings were filled with cement, and the walls of the cellar pointed. The floor, which had hitherto been loose, was laid with bricks in cement. The rats disappeared; but after a short time a wet spot was observed in the brickwork, near where the water supply pipe ascended. On examination, a number of dead rats were found in a space of the cutting made for the pipe which had not been filled up when the pipe had been moved, and, close by, the lead pipe had been gnawed right through. The above may be very easily explained. A family of rats had settled in the cutting; exit had been cut off by the closing up of all the holes; the rats, trying to get out, had attacked the lead pipe as being the softest material in their prison. They gnawed until they had made an opening, when they were drowned by the outflowing water. It may be of use to mention here that lead pipes may be efficiently protected against attack by rats or oxidation by winding well-tarred canvas round them, and afterwards applying another coat of tar.

WORKMEN'S VIEWS AS TO THE PATENT LAWS.

At the recent Manchester congress of trade unionists, Mr. W. J. Davis moved:—

"That this Congress again expresses its strong disapproval of the continuance of the unjust patent laws, which tax intellect unduly, and act to the disadvantage of the mechanic, who, generally unable to secure the benefits of his inventive capacity, is compelled to remit his right of originality; also regrets that the President of the Board of Trade has been unable to introduce his promised Patent Bill, and trusts that the Government measure will remove anomalies of which poor inventors so justly complain; and, further, this Congress instructs its Parliamentary Committee to watch both the Government and private measures, and to use every exertion to obtain equitable provision to all classes of the community."

He said if the patent laws of this country were compared with those of others, a great difference would be seen to exist. In England when a man brought out an invention he had to pay 25*l.* within the first six months, and 50*l.* seven years afterwards. Thus, whilst an invention cost 75*l.* in England, in France the fees were only 16*l.*, Germany 16*l.* 10s., Austria 10*l.*, United States 7*l.*, and Belgium 4*l.*, which conclusively proved that English artisans laboured under a great disadvantage to those of other countries. It often happened that a struggling inventor in Great Britain, finding he could not pay the 50*l.* at the conclusion of the seven years, sold his invention for a mere song to a capitalist, who traded upon it, and probably made a fortune; and this state of things was highly undesirable.

Mr. Threlfall (Southport) seconded the resolution.

Mr. Evans (Manchester) said he thought the law was one of the most unequal that an ingenious labourer had to contend with, and the sooner it was done away with the better. He could not understand why the law should be allowed to remain such a drag upon the intelligence of a workman. He heartily endorsed the endeavour which was being made to get the matter rectified. He only regretted that the machinery required to be put in motion was of such a cumbrous character. It was not very creditable to our legislature that gentlemen like Mr. Broadhurst, and others, who represented them in the House of Commons, had such great difficulty in obtaining a hearing upon such practical questions as these, and it was the duty of working men especially to support them in their efforts to bring about a remedy.

Mr. Drummond said that in Glasgow they had given their support to Mr. Anderson's Bill, and he thought that Congress would unanimously approve the motion now before it.

Mr. Evans (London) said he had received communications from twenty-six working-men inventors who were unwilling to exhibit their inventions at the Railway Safety Appliances Exhibition at Darlington, as they had not the means to obtain patents. Besides the great cost of taking out a patent, inventors had to contend with patent agents, whose charges were almost equivalent to a second patent-tax.

The resolution was carried unanimously.

THE NEW PUBLIC HALL AT BATTERSEA.

The new public hall which is to be erected at the foot of Lavender-hill, immediately adjacent to Clapham Junction Railway Station, by the Battersea and New Wandsworth Public Halls Company, is to be commenced at once. The first meeting of the company was held last week, when it was stated that the plans and specifications were all ready, and that the directors had received eight tenders from different builders, ranging from 12,430*l.* down to 9,560*l.*, the lowest tender being that of Messrs. Holloway, of Lavender-hill, and this tender was accepted. The foundation-stone of the building is to be laid in the course of the ensuing month by Mr. Sydney Stern. The site of the intended building is at the corner of the Lavender Sweep Estate, on which a large number of new houses are now in course of erection. It will have two bold and prominent frontages, one facing Lavender-hill and the other St. John's-road, Battersea-rise.

PROVINCIAL NEWS.

Birmingham.—Birmingham is about to receive an addition to its charitable institutions. In connexion with the Wesleyan "Thanksgiving Fund," which has now reached a total of nearly 304,000*l.*, Mr. Solomon Jevons made an offer to the committee that if from the fund they would make a grant of 10,000*l.* towards establishing an orphanage in the neighbourhood of Birmingham, he would supplement it by a donation of 10,000*l.* After due consideration the offer was accepted. Plans were prepared by Mr. J. L. Ball for as much of the building as it is proposed immediately to erect, and after tenders had been received from ten of the prominent building firms of the district, the contract has recently been let to Messrs. J. Wilson & Sons, Handsworth. The sanction of her Majesty the Queen has been obtained to call the building the "Princess Alice" Orphanage, in memory of her lamented daughter, the late Princess of Hesse. A site has been selected on the Chester-road, about equally distant from Erdington and Sutton Coldfield, and close to the Beggar's Bush. The arrangement of the orphanage buildings will be such as to give the idea of a village rather than that of a public institution. Facing the Chester-road, at a distance of about 130 ft., will be an irregular line of buildings, altogether nearly 250 ft. in length, which may be regarded as the administrative block, consisting of the master's house, the offices and Board-room, the belfry and great hall, the kitchens, store-rooms, bakehouse, and kitchen offices. These buildings, though of varying heights and outlines, are connected. The most important is the great hall, 90 ft. by 33 ft. and about 20 ft. high, intended to be used not only as a dining-hall, but also for the daily morning prayers, for general gatherings, and, until the chapel is built, for divine service. Behind the administrative buildings, on the right hand and on the left, the cottages or "homes" will be placed irregularly and at varying intervals. When complete, there will be twelve cottages for boys, and twelve for girls, each providing accommodation for about twenty-five children, together with matron's rooms. These farm-cottages will stand detached in separate plots of ground, and will be of different designs. Schools, workshops with facilities for carrying on about a dozen industries, baths, farm buildings, and a farm bailiff's house will be built on various parts of the estate, and the little colony will be completed by a chapel.

Nottingham.—The *Nottinghamshire Guardian* says that lovers of the picturesque in the quaint Old English style of architecture prevalent in our oldest towns will soon lose a well-known specimen, recently dignified by the name of King John's Palace, situate in Bridlesmith-gate, Nottingham. The whole of the premises known as the "Palace," and the old oaken-built structure known as Rose-yard, are now being pulled down to make way for other buildings to meet modern requirements. The proposed new buildings, which are to be erected from the designs of Messrs. S. Dutton Walker & Howitt, are, in style, to follow the semi-timbered framing of the ancient structures which formerly were so frequently seen in our streets, but which are now nearly all swept away. The building about to be removed is mainly constructed of oak framing, owing, no doubt, to the contiguity of Nottingham to Sherwood Forest. In the interior much of the quaint old work has been demolished, especially on the ground-floor, but the upper rooms are all wainscoted with oak panelling,—of course painted, as usual by the Goths and Vandals, with beautiful stone colour. On removing part of the wainscoting, Mr. Walker found in several rooms some very interesting stencilled decoration. Photographs have been taken to preserve some record of the old structure.

Heaton Mersey.—Mauldeth Hall, Heaton Mersey, was on the 15th ult. opened by the Bishop of Manchester as a hospital for incurables. The building was formerly occupied as a mansion by Mr. W. Romaine Callendar, from whose executors it was bought for the sum of 15,000*l.* It stands in well-wooded grounds, with gardens and lawns, and may be described as palatial. It is of Classic architecture, with frontages of Yorkshire stone. A wing has been added, and the interior altered and improved, the total cost of the additions and alterations amounting to 8,000*l.*, making a grand total of about 24,000*l.* The architect is Mr. Charles Heathcote, Manchester; and the builders, Messrs. Wilson, Toft, & Huntley, City-road, Manchester. Bishop Fraser, in the course of the proceedings, said the building, in its original shape, once belonged to him. The last bishop selected it as a suitable house for the Bishop of Manchester. He (the bishop) did not think it was suitable, and he absolutely refused to live there. For two years the building was a considerable burden to him. The Ecclesiastical Commissioners would not allow him to part with it until he got a house in its place. By good fortune he did get another house, and in 1873 was relieved from his responsibility. Mr. W. Romaine Callendar bought the property from the Ecclesiastical Commissioners, and spent a considerable sum of money in ornamenting and enlarging the house, but, unhappily, was spared only a few years afterwards to live in it. The building had thirty acres of land belonging to it, including some admirable gardens, which were now let out and produced an income of 200*l.* a year. By the taste and skill of the architect, the building had been enlarged and adapted to its present purpose.

Accrington.—On the 16th ult. the new Conservative Club at Accrington was opened. The building is situate at the junction of Blackburn-road and Eagle-street, nearly opposite the Railway Hotel, and close to the railway station. The entrance is in the Blackburn-road façade. Ascending four stone steps in the outer vestibule, the inner hall, 8 ft. wide, is reached. On the left, towards Eagle-street, is the news-room, 24 ft. by 20 ft., lighted from Blackburn-road and Eagle-street, and fitted with newspaper desks, tables, and furniture. This room has an enriched ceiling, and is surrounded by a dado lining, 4 ft. high. Beyond this room, on the same side, is the billiard-room for first-class members, 25 ft. by 20 ft., lighted from two sides, and fitted with permanent seats on one side and one end. On the right of the hall is the smoke-room for first-class members, lighted from Blackburn-road. This room is furnished by Messrs. Kendal, Milne, & Co., of Manchester, who have supplied most of the movable furniture. At the extreme end of the hall are the lavatory and offices. The floors of the hall and vestibule are paved with encaustic tiles from the works of Messrs. Maw & Co., Broseley. The principal rooms on this floor are 14 ft. 6 in. high. On the right of the hall are also the servery and porters' kitchen. On the first floor to the right is the large billiard-room for second-class members, 48 ft. by 20 ft., lighted from the two main fronts and from the roof. This room will contain two billiard-tables, and is fitted with permanent seats. In connexion with this is a smoke-room, 20 ft. by 9 ft., lighted from Eagle-street. Over the front lobby is a dining-room, 15 ft. by 8 ft., lighted from Blackburn-road, and in communication with the balcony fixed over the entrance gateway. To the left of this is a large committee or lecture room, 22 ft. by 20 ft., calculated to seat about 130. The wrought-iron gates, gasfittings, and railings are

by Messrs. Dutton & Powers, of Manchester. The internal joinery is executed in Baltic timber, selected pitch-pine being used for panels, and all stained and varnished. Externally, the walls are built of Yorkshire stone, the ashlar being from the Ringby quarries. The style of the building is Domestic Gothic. The architect is Mr. Henry Ross, of Accrington.

Lancaster. — Extensive alterations and improvements will be made to the Palatine Hall early next year. The Committee of Trustees have adopted designs prepared by Mr. Geo. D. Oliver, of Carlisle and Workington.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

A Northern district meeting of the members of the above association was held in the Town-hall, North Shields, on the 27th ult., under the presidency of Mr. J. G. Lynde (Manchester). The advisability of reviving the adjourned discussion of the paper on "Private Improvement," read by Mr. Hall, of Stockton, in April last, was the subject of debate. It was resolved that the consideration of Mr. Hall's paper be deferred till the next district meeting. Mr. P. W. Thompson, hon. local district secretary, Willington Quay, read a paper on "The Operation of the Canal Boats Act," written by Mr. E. C. Buchanan Tudor, engineer and surveyor to the Goole Local Board, who was unable to be present. It stated that when the Act of 1877 came into operation there were upwards of 1,000 boats, commonly called keels, trading through the port of Goole, the whole of which were used as dwellings, and required legislation. The cabin space was almost in every instance too limited for the number of people inhabiting it; the means, if any, adopted for ventilation were insufficient, and the arrangements for the fittings were defective. The sleeping accommodation was rarely, indeed, what could be desired or deemed even decent, and frequent occurrences of overcrowding and immorality prevailed. He thought that a systematic periodical inspection of the boats would be a practical improvement. The effective and beneficial working of the Act must always to a certain extent depend on the industry, zeal, and knowledge of those appointed to carry it out, and his opinion was that if these officials were appointed by Government for combined districts, rather than by local authorities, constant supervision would be maintained. In the discussion which ensued, a unanimous opinion was expressed that the last suggestion was an important one worthy the consideration of engineers and surveyors. The meeting closed with votes of thanks to Mr. Tudor for his paper, and to the Mayor and Corporation of the borough of Tynemouth for their courtesy in placing the Town-hall at the disposal of the association. The members afterwards visited the Coble Dene Dock, the Piers Works, and the North-east Coast Exhibition.

THE MUNICH ELECTRICAL EXHIBITION.

Though perhaps not such a brilliant display as the Paris Electrical Exhibition, that of Munich is, from a scientific point of view, of exceptional value, more particularly from the fact that metric and other instruments of quite recent invention are shown, which facilitate the estimation of the power and consequent value of any dynamo-electrical machine. In this manner calculations are rendered much more simple as to the cost of the electric light, respecting which there has been hitherto a want of means of arriving at an exact idea of the expense it entails.

There are no less than twenty-two steam-engines at work for the purpose of furnishing the motive power required by the electric light in the exhibition; there are also several gas engines. A remarkable instance of the transmission of force is furnished by the over-ground copper-wire communication, which renders available for the working of several kinds of machinery the water-power at the Maffei machine-factory at Hirschau, three miles distant, and in a similar way there is a transmission of power effected from Miesbach, which is at a distance of thirty-one miles. The transmission of sound affords visitors the opportunity of hearing music which is being performed at a distance. Special prominence is given to the discoveries of Edison, to which a special department in the exhibition is devoted.

Amongst the other specialities of the exhibition is a photographic gallery, in which electric illumination is utilised both for the taking and copying of photographs. A model on a large scale of a railway, with two termini and an intermediate station, exemplifies in a lucid manner the system of railway telegraphy. An instrument, entitled the Glossograph, registers in an automatic manner spoken words, and though not at present in a complete form, it is, nevertheless, an interesting exhibit.

The electric fire-alarm is shown in connexion with the protection of buildings from the ravages of fire, and lightning-conductors also form appropriate objects of exhibition. The financial results of the enterprise seem to have been so far of a satisfactory character.

JOTTINGS FROM THE NEWCASTLE HEALTH CONGRESS.

In the section devoted to Chemistry, Meteorology, and Geology,

Mr. G. J. Symons read a paper, prepared by Mr. H. C. Bartlett, Ph. D., F.C.S., "On the Influence of Minute Suspended Matter on Health: its detection, collection, and examination." He said pollutions of the air were frequently diffused in a gaseous form, and required great delicacy of chemical investigation to estimate the proportions in which the gases might be taken up by the atmosphere, and in what proportions such gases must be deemed injurious to health and life. Men worked in breweries, soda-water factories, and gasworks without loss of health from breathing offensive gases, while people in crowded buildings often suffered from headache and depression. He had, therefore, been forced to the conclusion that the serious and even dangerous effects of bad ventilation were mainly due to matters carried in the air not in a gaseous form, but suspended as minute particles. It had been ascertained many years ago that solid particles of matter, either inorganic or organic, living or dead, were suspended in the air, and practically these same particles might be found in suspension in almost all drinking-water open to the air.

Mr. Symons also read a paper on "The Improvement of Climate with Slight Elevation," which had been prepared by the Hon. F. A. Rollo Russell. He showed that repeated observation had proved that at points artificially or naturally raised above the surrounding district the range of temperature was smaller. The practical conclusions seemed to be that invalids and delicate persons would generally be best placed in high-sheltered situations, in the highest rooms of a house, and by no means on a ground-floor; that a climate resembling that of the seaside, but less damp, could be obtained by living at the top of a high house; that every house ought to be built on arches, or thoroughly ventilated below and raised on piers above the ground level, and that no house or cottage which is not ventilated underneath, with damp-proof walls, should be considered habitable; and that in the country no house should be considered habitable of which the floor is on a level with or below the ground.

A paper by Mr. R. Carr-Ellison on "The Influence of the Purity or Impurity of the External Atmosphere on Public Health, Public Comfort, and on Domestic Habits of the People," was read in his absence by his son, Mr. Edmund Carr. He said that on Tyneside such was the cheapness of coal that it had always been used with a most lavish and wasteful profusion. The discharge of densely-opaque smoke from the chimneys of furnaces, factories, breweries, and the like, in vast volumes after every replenishment of fuel, was the rule and not the exception. There was, however, one honourable and distinguished exception, — that of Sir William Armstrong & Co., at Elswick,—where a vast business was conducted with as little production of smoke as possible, and with corresponding economy of fuel. The smoke pall which hung over Newcastle and Gateshead from Monday morning till noon on Saturday was fearful to behold, and had a decided effect upon the ventilation of even the best class of dwelling-houses in the two towns. He strongly advocated that the local authorities should take steps to stop the disgraceful cloud of smoke so often seen in the district.

The chairman (Dr. Arthur Mitchell, F.R.S.) said he did not suppose there could be a doubt that the smoke of a town had an unwholesome influence upon the health of the people, and it had been proved that by mechanical arrangements they could get quit of it, but the law to suppress it was not applied. He did not think that attention could be too often directed to a subject of this kind, which was of public interest; but, for the reasons which had prevented the discussion of other papers, he proposed that they should receive the paper without discussion, and that they should record a vote of thanks to Mr. Carr-Ellison for communicating it.

Mr. R. B. Grantham read a paper "On the Establishment of a Library for a special Branch of Sanitary Information at Newcastle." Having for some time taken a practical interest as an engineer in the execution of sanitary works, he had become impressed with the necessity which existed for a collection of the numerous reports and other authoritative publications on the subject, and he was desirous of suggesting that a special library of such works be formed at Newcastle for reference, and as a means of promoting the study and diffusion of sanitary science. He had made a small collection, which he was willing to place at the disposal of the Scientific and Philosophical Society as the nucleus of such a library, and he had added a list of works which he considered might be proper to include in the collection. These would, however, be inadequate to carry out his views, but he wished to intimate that many of the learned societies would, upon application, furnish copies of their publications, reports, &c., upon the understanding that a really representative collection would be formed and efficiently maintained for purposes of reference and as a means of information to those who were desirous of studying and practising sanitary science.

In the section devoted to Sanitary Science and Preventive Medicine, Dr. Lediard read a paper on "Arsenic in Domestic Fabrics." He showed that large amounts of arsenic existed in wall-papers, materials used for dress, crétons for bed-hangings, carpets, &c., and that these things had a seriously injurious effect on the health of persons coming in contact with them, and were frequently fatal. He contended that a case had been made out for legislative interference. Some amongst those interested in this subject objected to the further interference with the liberty of the subject by the imposition of additional laws to prohibit the use of arsenic and other poisons in domestic fabrics, but he held strongly that laws were good if only to appeal to in cases of real necessity. Much work, he thought, still required to be done in systematically examining all and every kind of material of wearing apparel or fabrics used in house decoration; for it would be found that arsenic was present in many things apart from wall-papers, which had performed the task of calling attention to this important subject.

ECCLESIASTICAL ART EXHIBITION AT DERBY.

In connexion with the Church Congress this week in Derby, there has been held an ecclesiastical art exhibition, the special feature of which was the loan collection, numbering upwards of 400 separate exhibits. Embroidery, both ancient and modern, was largely represented, and amongst the former may be mentioned a vestment of thirteenth-century date, exactly the same as the celebrated chasuble in Salisbury Cathedral. By some chance it came into the possession of the Dutch, and was stolen from one of the churches of Holland during the Wars of Independence, and latterly was in the possession of the Archbishop of Utrecht. It is the property of Mr. W. Baker. There were numerous specimens of modern work, including sets of vestments from Prestbury, contributed by the Rev. Bagehot de la Bere; a cope worked for St. Clement's, Bournemouth, by Messrs. Cox & Co.; and an altar frontal, cope, and dalmatic, by Messrs. Jones & Willis; the two last having been shown at the Great Exhibition in 1851, when they received a prize medal. Mr. Douglas Horsfall exhibited an altar frontal, worked by Mrs. Robert Horsfall, intended for the new Church of St. Agnes, Liverpool, shortly to be erected as a memorial to her late husband. Modern embroidery was represented by specimens of the work of the East Grinstead Sisterhood.

Metal work and enamels formed an important branch of the collection. Mr. Russell showed a good example of *champlevé* work of the twelfth century, being a plate with a representation of the Presentation. Mr. Clark's exhibit included a selection of bronze plaques, ornamented with Scriptural subjects. Mr. Malim showed the chalice and paten used at St. Dunstan's Brotherhood at Plaistow. Mr. Llewellyn Jewitt sent a pair of Russian consecrated pendants, or images for personal wear, in gold, silver, and enamel; some Græco-Roman bronze crosses and crucifixes, together with a triptych and a pectoral plate in bronze and enamel.

One of the most striking items of the collection was the model of the Shrine of St. Ursula, the original of which is at the Hospital at Bruges, and is the work of Hans Memling. It consists of a cabinet in the form of the nave of a cathedral, covered with exquisite paintings, representing various incidents in the life of St. Ursula, from the landing at Cologne to her apotheosis.

Pictorial art was represented by various photographs and chromolithographs of ancient pictures, illuminations, drawings of churches and ecclesiastical furniture, engravings of chalices, and a large collection of rubbings of monumental brasses and incised slabs.

The Rev. J. Fuller Russell sent a very interesting and valuable collection of manuscripts and early printed books. Amongst the former were included a Sarum Missal of the fifteenth century, containing elaborately-executed borders of the "English flower type," together with the usual "Crucifixion" at the beginning of the Canon.

Amateurs of ivories and wood-carving found much to admire in Mr. Henry Clark's collection, which included about a hundred examples of plaques, statuettes, triptychs, caskets, &c., mostly belonging to the sixteenth century. Mr. Watkin Williams Wynn contributed a fine ivory diptych of fourteenth-century date, probably Nuremberg work, and the Rev. F. Jourdain showed part of an ancient triptych with figures of saints, belonging to a Derbyshire church.

HAMMERSMITH BRIDGE.

At the meeting of the Metropolitan Board of Works on the 29th ult., several deputations from local authorities and inhabitants attended to urge the provision of a temporary bridge during the reconstruction of the superstructure of Hammersmith Bridge. Mr. Richardson subsequently moved:—"That it be referred to the Bridges Committee to ascertain and report whether the Board has statutory power,—(1) Entirely to close Hammersmith Bridge during the progress of the works now under contract; (2) To incur expenditure in making temporary provision for the traffic during such time as the bridge may be closed. That the committee be authorised to obtain the opinion of counsel, if it should be considered necessary." The mover observed that the agitation that had been going on during the recess in regard to Hammersmith Bridge had at any rate been the means of informing him of one circumstance of which he was not previously aware. He most certainly was not aware that *any* provision was to be made for the conveyance of the traffic across the river while the bridge was closed. He had made inquiries on the subject, and the Engineer had told them that these clauses in the specification for the provision and maintenance of a ferry were submitted to and approved by the Bridges Committee. He had endeavoured to ascertain if this was the case, but neither the clerk nor the chairman of the committee knew anything about it, and he thought he might say that this particular point was never brought before the committee at all, except that the specification was submitted for approval in the usual formal manner. So far as Hammersmith Bridge was concerned, the Board was proceeding under the Act of 1877, and the only duty or power of the Board in respect of the bridge under that Act was contained in the words, "The bridge shall be maintained and repaired by the Board." The question, therefore, arose under what authority the Board had the power to expend a considerable sum of money for the purpose of providing means of communication across the river when the bridge was closed. There was no such power given to the Board in this Act or in any other Act. There appeared to be no authority whatever, except that of the Engineer, for such clauses being inserted in the specification, and it was quite clear that the insertion of these clauses had given rise to all the excitement that had arisen. It had also given rise to the idea that the Board was responsible for the conveyance of the traffic across the river during the time that the bridge remained closed, whereas any such action would be outside the powers of the Board, and any expenditure incurred for such a purpose would be liable to be disallowed by the auditor when the accounts were examined. This was a matter in which the Board was entirely subject to the control of Parliament, and, although they were a body representing the whole metropolis, they were not allowed by Parliament any discretionary power whatever in dealing with these questions. He thought it very desirable that the Board should have a discretionary power to provide for the conveyance of traffic across the river during the time that a bridge was closed.

The motion having been seconded,

Mr. Runtz said it appeared to him altogether unnecessary. The whole subject had been referred to the Works Committee, and, if the reference now suggested by Mr. Richardson was necessary at all, it ought to go the Works Committee, and not to the Bridges Committee.

Mr. Fell moved, as an amendment, that the Works Committee be substituted for the Bridges Committee.

Mr. Richardson accepted the amendment, and the motion, altered in accordance therewith, was agreed to.

WHAT IS PROPORTION?

Sir,—Both your correspondents of last week,—Mr. Aitken and Mr. Giraud,—attribute opinions to me the very reverse of those I hold, and that I have repeatedly expressed. I have always contended that it is absolutely impossible to separate proportion, in the sense of quantitative relation, not merely from construction, but from existence. Everything in the universe exists either in proportion or in disproportion. But of those things which are proportioned to their purposes, only some are at the same time proportioned to taste. The satisfying of taste is an end in itself, and to formulate the science of the beautiful we have to discover those degrees of manifestation and those quantitative relations (proportions) which are apposite to taste. But the beautiful is neither the sole aim of nature nor of art. If the beautiful had been the sole aim of nature we should never have had to discuss the matter, for everything would then have been beautiful; but as things are constituted, we know that some, though perfectly proportioned to their special ends, are not beautiful, whilst others, equally fitted to their special ends, are coincidently apposite to taste. The hippopotamus, the toad, and the floating derrick, for instance, though perfectly proportioned to their respective purposes, do not exist in proportions agreeable to taste, whilst, on the other hand, the human form and the egg-shape exist in proportions which, at the same time that they are proportioned to their ends in creation, are proportionate to taste.

In respect to Mr. Giraud's letter, I beg to say that not a word about "habit" or "custom" will be found in my letter of the 16th ult., though I have endeavoured to show in my correspondence on former occasions that "habit" is a factor which complicates æsthetic questions, and increases the difficulty of determining those proportions that are purely apposite to taste. He also falls into the common and fatal error that taste is founded upon some arithmetical harmony, some occult harmony in numbers, or on geometrical relation. Now, the music of form, of colour, and of sound is not founded on anything of the kind, but on the laws of our own nature, on the nature of the senses of sight and of hearing. Numbers are but the symbols by which we write down, numerically express, those degrees and quantitative relations that are apposite to our sensuous nature. From this error proceeds the perennial insistance on the virtues of the regular geometrical figures. Now these are demonstrably not those figures which are most apposite to taste; these regular forms are approximated in nature only in its more elementary, material, and primordial forms; they are rarely to be found in the higher forms either of life or of art. Neither in the Grecian pediment, frieze, columniation, nor general forms do we find the regular geometrical figures, much less in that quintessence of the beautiful,—the human form.

Your correspondent forgets when he sneers at the word "æsthetic" that that word was in use when the Parthenon was built, and in the same scientific sense as at present. Its introduction is novel only to this unæsthetic race. I believe that the Greeks had a science of proportion, and that I have re-discovered and re-formulated that science. But if they had a science of formative proportion, it must have been founded in reason. If "the depth and projection of the smallest member was regulated" in Grecian architecture, as your correspondent affirms, let us know the why and the wherefore, or it must be set down as mere assertion. And if it be known why, why then we are on a level with the Greeks, and we could go and do likewise. I maintain that no one is in a position to affirm whether the Greeks were æsthetically right or wrong, unless they themselves have topped the science of proportion. Until the science of proportion be mastered we must withhold our judgment, for it is possible to be the slaves of habit in matters of taste. Without such a science, clearly worked out, it is merely bold and bald reiteration to affirm the perfection of Grecian art. In conclusion, I must most emphatically deny that I "dubbed" all those who may differ from me as half-educated. What I did say, with respect to half-education, had reference to a special form of misconception, with the correction of which, in the very opening of his letter, your correspondent concurs. One word more, and I have done. In my letter of the 16th ult., "opposite to sense," ought to have been, as may be gathered from the context, *apposite* to sense.

W. Cave Thomas.

SANDOWN CASTLE.

I have just returned from Deal, and quite re-echo the remarks of Professor Hayter Lewis a few weeks ago. The ruins of Sandown Castle should be preserved, and if they could be used for no other purpose they would form an admirable bathing-machine. For bathing, Deal is about the worst place on the coast,—the sands have all gone to Goodwin! Nothing but shingles left on the beach,—larger than walnuts, and very unpleasant to the feet. At Sandown Castle, on the contrary, bathing is very pleasant, and the old castle makes an excellent shelter. Could not the idea be improved upon? The above suggestion is not mine; it is the idea of many I saw there bathing,—old and young. The castle is a gentle walk from Deal, just beyond the bathing regulations. Might it not be included within them, so as to prevent the idea from being abused?

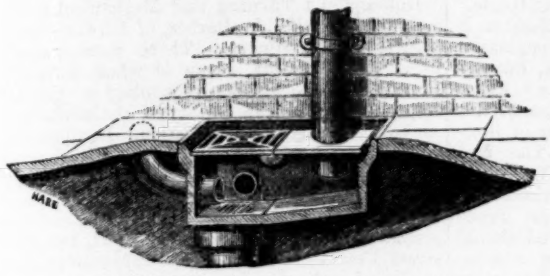
Deal boasts of being the oldest bathing town in England. The inhabitants tell you Julius Cæsar bathed here August 26th, B.C. 55, with his Roman followers, on their first introduction to the Britons! The Saxons and Danes subsequently frequently bathed here before having a plunge at each other! But, joking apart, Deal is a very interesting central point to spend a week's sojourn from London. Here are Deal and Walmer castles, of similar plan, date, and style to that at Sandown. Walmer Church is noticed in Parker's Glossary, and Dover is within easy reach. Inland are Upper Deal, Great Mongeham, and Northbourne, described by the late Mackenzie Walcott in his "Coast of Kent" (a little book published by Stanford, Charing-cross, which no one should go without). North of Deal is the famous Roman Richborough Castle, and the quaint old town of Sandwich with its Norman church of St. Clement.

W. F. Potter.

The Opera by Telephone.—An interesting experiment took place at the opening of the present session of the London Hospital Medical College, on Monday evening, when a *conversazione* was given to a large company. By the kind permission of Mr. W. S. Gilbert and the United Telephone Company the Anatomical Theatre was placed in telephonic communication with the Savoy Theatre, and by this means many of the audience in the former building heard distinctly the æsthetic opera "Patience." The electric light used on the occasion is spoken of as being a great success, Professor Crookes's incandescent lamps being adopted (for the first time at a public exhibition), driven by a Gülcher dynamo machine.

BELLMAN'S PATENT GULLY.

Messrs. Bellman & Ivey, of Wigmore-street, have recently introduced a gully, as shown below and in our advertising columns, which appears to be making its way. In size it measures 16 in. by 8½ in. by 7 in. deep. It receives the main rain-water pipe of the house, and three waste-pipes, and disconnects the whole from the drain, as between it and the gully a P or S trap is fixed, which will necessarily always contain a water-seal. Over the outlet to the trap a grating is fitted, which prevents any solid matter



passing through, and the surface-grating being loose and of ample size, the trough of the gully can be kept clean with the greatest ease. Bellman's gully offers a great advantage over those made with the trap in one piece, as no matter where the drain may be, the gully may always be placed at right angles, as the trap can be turned in any direction to meet it. There is no splashing, and, at the same time, the gully acts to a certain extent as a ventilator to pipes and trap. Taken as a whole, it seems well adapted for the purpose for which it is intended, and is introduced at a price calculated to promote its extensive adoption.

From what we have seen of it in operation, we are disposed to recommend it for trial.

REREDOSES.

The parish church of Bettys-y-coed has lately received the addition of a reredos, as also a low stone wall, with moulded capping, under the chancel arch. The reredos, of simple design to suit the character of the church, is of Corsham Down Bath stone, the panels being of Forest of Dean stone. The central portion is emphasised by being slightly brought forward, and has a carved cresting. It consists of a wider central panel, with square shoulder cusp, having three panels on each side, containing, in carving, the lily, rose, wheat, grapes, passion-flower, and trefoil, and, over them, six square panels, quatre-foil cusped. The side wings each contain five arched and trefoil-cusped panels, with circular carved bosses between the arches. Above is a delicately-carved frieze of flowing foliage. Below the arched panels is a species of enriched string-course, with square pateras, and, underneath, a diapered ground. The funds were raised by a member of the congregation.

A neighbouring church, Yspytty, has likewise been furnished with a reredos, the gift of Lady Penrhryn. It is executed in Corsham Down Bath stone, the panels being of Dumfries stone. The height between the top of the table and the window being very limited, special means had to be taken to emphasise the centre. The hollow of the string-course or cornice is enriched by a pearl ornament. There is an elaborate Greek floriated cross in the centre, having on each side two square-headed cusped panels, separated by narrow projecting bands, containing various emblematical carvings. The panels to the wings of the reredos contain quatrefoils in the upper part, and, underneath, some reticulated work, formed by narrow projecting bands.

Both reredoses were executed from the designs of Mr. B. Edmund Ferrey, and carried out by Messrs. White & Sons, of Vauxhall Bridge-road.

MASTERS AND MEN IN THE BUILDING TRADE.

Sir,—I have just read the letter of "A Builder," in your impression of September 23, in which Mr. Potter's name is mentioned. Can it be possible that another strike is being worked up? I do hope that my brother working-men will not be influenced in that direction by any individuals any more. What about 1859, when many a man starved his wife and family, and himself too; sold his home; and what good has come of it? The secretaries of two or three trades have got into freehold houses; the victims are scratched, or in their grave, and the price of food, lodging, and clothing is forced up to an unnatural height; in point of fact, the money has lost its purchasing value, so that, in reality, wages have not risen at all.

I have read the report of the Trade Unions Congress: they do well to speak against paying wages in the public-house, but they would do better if they took their lodges from the public-house, and they would do better if they abolished the striking rules. If a man is not satisfied with his pay, let him seek a job elsewhere, and let him aid his fellow workman too. It is what we all ought to do, but when a secretary tells him that he must *sell his home* at the bidding of a committee, then I say "Perish the committee." The vote and the ballot, and the knowledge how to use them, are of more consequence, and will do more good for the working class of the country than all the strikes rolled in one; and let me beg my brother workmen to pause before they are led into one. If the young men who have got into the building trade were to study the history of the struggles of the working class, and notably strikes, they would find that organised strikes are only another name for the most odious tyranny under the sun.

There is much reform needed in many things; an English workman's life is not all honey, neither is an employer's, as the records of the Bankruptcy Court can tell; but when men come forward to lead us, those who are to be led have a right to inquire, Where are you going to lead us? What are you going to bring us to? Starving wives, broken homes, documents, blacks, whites, rows, riots, examinations before the magistrates! Look at the gas-stokers, the masons, the cabinet-makers, and others.

I am only a tailor myself, and I have fought in many a battle for progress, but there never has been, and there never will be, any permanent good come out of organised strikes; they are only palliatives.

For mercy sake, Mr. Editor, find a space for these few lines. Anti-Strike.

P.S.—I have been ruined by the striking system, and if you would be so kind as to insert my letter, I should feel obliged. Why should employers and employed act the part of madmen and destroy one another?

DRYING BUILDINGS.

With reference to the particulars we gave of the new Railway Hotel, Preston, Lancashire (p. 410, *ante*), Messrs. Dreyfus & Co. say:—

"We saw in your pages an article on this building. We beg to inform you that the whole of the building was dried by us with 'Ligny's Patent System.' This is the second hotel we have dried for the London and North-Western Railway Company,—Euston being the first one. We have also just completed drying the new Church of St. Mary, Whitechapel, so that the plaster of the interior may be decorated at once."

CHURCH-BUILDING NEWS.

Revelstoke.—The new church which Mr. E. C. Baring, the well-known banker and princely owner of Membland Hall, near the picturesque river Yealm, has just erected upon his estate at Revelstoke, was consecrated on the 6th ult. by the Bishop of Exeter. The church is perched upon the steep hill side, overlooking the sluggish Yealm. In the Perpendicular style of Gothic, it has a western tower, nave, aisles, chancel, and a large south-western porch. The fall of the ground is utilised for the introduction of vestries underneath the north aisle,—with which they communicate at their eastern end by a winding staircase, with turret. The main walls are of stone raised on the estate, and all the masonry dressings are of local granite. The roofs are of the local "wagon-head" shape,—stopped at the intersection of every rib and purlin by bosses. In the chancel the roof is made additionally rich by the introduction of sculptured angels representing the Church militant and triumphant, and by continuous running ornamentation. The walls of the chancel are lined with polished marble inlaid in various hues. This is the work of Mr. Gullett, of Yealmpton. The green Devonshire marble used is said to rival the best specimens from Galway. The pulpit stands upon the north side, and is of oak, upon a granite base. The seating throughout the church is entirely of massive oak. The bench ends and their fronts and backs are all diversely carved, the rich type of work prevalent in this county in the fifteenth century being carefully kept to. In the corner of one of the sculptured bench-ends, representing apparently a great sea-fight between galleons belonging to the Barings with their ancient foes the Spanish aggressors, there is inscribed in modest characters the following legend:—"Harry Hems and his merrie men carved all these benches at Exeter, A.D. 1882." It has been the aim of Mr. Baring that the church should be, in all respects, an entirely West Country production,—that Devonshire workmen and materials should be employed in preference to all others. The church has been designed by Mr. James Piers St. Aubyn, architect; the windows and other decorations are by Messrs. Fouracre & Watson, of Stonehouse. The main part of the whole edifice has been entirely built by Mr. Baring's own estate workmen, under the general supervision of Mr. Samuel W. Adams, of Plympton, his agent, and the immediate direction of the resident clerk of works, Mr. George W. Crosbie.

Ambleside.—The work now being carried out at Rydal Church comprises re-seating to nave in oak, new vestry and heating chamber, and windows to nave in freestone. The pulpit will be of old dark oak, with stone base and steps, having drapery panels in the lower part and open tracery work in the upper part. The floor of the church throughout will be laid with wood paving of an improved kind, recently introduced by the architect, and now very largely used in churches, schools, &c. A new chancel and organ-chamber with roof to nave will be built as funds permit. A special interest gathers round this church from the fact that Wordsworth, the poet, worshipped there, his residence being close by. The work is being carried out by local contractors, Mr. W. Stalker having the contract for woodwork, and Mr. T. Newton that for masonry. The whole of the alterations have been designed by Mr. R. Walker, architect, of Kendal and Windermere.

Small Heath, Birmingham.—On the 9th ult. the foundation-stone was laid of the Memorial Church which is about to be erected in Cooksey-road, Small Heath, to the memory of the late Rev. Dr. Oldknow. The style of the building will be Early English, simple in character, with very little attempt at ornamentation. When completed the church will consist of nave, with tower and spire at the north-west angle, north and south aisles and transepts, chancel, morning chapel on the north side of the chancel, and sacristies on the south side for the clergy and choir, with an organ-chamber over the latter. The exterior walls will be of red brick, with red Kenilworth stone mouldings and dressings; and the interior will be lined with white bricks, with red-moulded brick arches to nave, transepts, chancel, windows, &c., with Kenilworth stone mouldings and dressings and Wilderness stone columns. Provision is made for Devonshire marble shafts to carry the roof principals, which it is to be hoped may be given by generous donors during the execution or after the completion of the work. The extreme length from east to west will be 124 ft., and the width from north to south 56 ft. The height to the wall-plate will be 36 ft. The height of the spire will be 120 ft. Accommodation will be provided for about 700 sittings eventually, the first contract, consisting of the nave and north aisle, having accommodation for 510. The contract has been taken by Messrs. J. Barnsley & Sons, of Ryland-street North, and the plans have been prepared by Mr. A. E. Dempster, architect and surveyor, Temple-row, Birmingham.

Hebburn Colliery.—On the 2nd ult. the foundation-stone of the Church of St. Oswald, Hebburn Colliery, was laid by the Rev. H. B. Carr, vicar of Whickham. The church is being erected from drawings by Mr. C. H. Fowler, F.S.A., architect, Durham, and will, when complete, consist of nave, aisles, chancel, bell-turret, organ-chamber, and vestry. The present contract (amounting to 1,777*l.* 10s) is for nave and aisles only, to seat about 350 adults. The chancel will be built at an early date. The builder is Mr. S. B. Burton, of Newcastle. The church will be built of brick, with stone window dressings and arches. The lighting will be by a large four-light window in the west end, nine windows in the aisles, and eight windows in the clearstory. The floors will be formed of solid wood blocks, bedded on concrete, to prevent liability to dry rot. Special care has been also taken to prevent damp rising in the walls

by the use of asphalte and Taylor's patent vitrified damp-course.

Oswaldtwistle.—On the 16th ult. the foundation-stone of a church to be dedicated to St. Paul was laid by Mrs. Watson, of the Rhyddings. The new church will seat 800 adults, and its cost, exclusive of tower, spire, and boundary-wall, is estimated at 6,500*l.* The site was given some years ago by Mr. R. Watson. The design is in the Middle Pointed style of architecture, and the total length of the church, outside measurement, will be 146 ft. 10 in. The interior will consist of chancel, a large parish-room, vestry and organ-chamber, nave, north and south aisles. The arcade dividing nave from aisles will be supported by ten granite columns with bases and floriated capitals. The western front will have two entrances, with a spacious narthex, 6 ft. wide. There will also be three other entrances. The church is to be built of local stone, from the Starhill quarry of Mr. W. Metcalf, with Box-ground dressings. The architects are Messrs. W. G. Habershon & Co., 38, Bloomsbury-square, and the builder is Mr. Thomas Clegg, Oswaldtwistle.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Boyle.—On the 17th of September the new Roman Catholic church, dedicated to St. Joseph, at Boyle, was consecrated. The church, which is within a short distance of the town, is erected on a picturesque site, close to the Convent of the Sisters of Mercy and to the new schools. It is separated merely by the river Boyle from the magnificent ruins of the Cistercian Abbey. It is late thirteenth-century Gothic in style, and is of the usual cruciform shape, consisting of nave, aisles, and transept. The length extends fully 120 ft., the breadth is nearly 60 ft., and to the ridge of the roof the height is about 70 ft. from the ground. At the western end is the tower, rising 60 ft., the roof being surmounted by an elaborately-wrought cross. The inside of the church has been thoroughly finished. The roof is supported by twelve massive pillars of limestone, and the aisles are subdivided from the nave by four bays of the same material, resting upon caps, shafts, and bases. The three altars, which have been executed by Mr. O'Neill, of Great Brunswick-street, Dublin, are the work of Irish industry. The canopy of the high altar reaches to a height of 13 ft., and is 12 ft. wide, while beneath the table is an elaborately-carved panel bearing a motto on either side, and containing a group of the Annunciation and an angel. The general material is of Caen stone, all the shafts being of emperors' red and Irish marbles. In the reredos, which is subdivided into four panels, there are four statues representing the four evangelists. This altar is the gift of the late Mr. Thomas M'Dermott, Belanagare. The side altar of the Blessed Virgin, and the altar of St. Joseph, consist chiefly of Irish marbles. The entire cost of the church is about 8,000*l.* Messrs. Goldie & Child are the architects of the building.

SCHOOL-BUILDING NEWS.

Cheadle Hulme.—On the 2nd ult. the Bishop of Manchester opened new school-buildings for the Manchester Warehousemen and Clerks' Orphan Asylum at Cheadle Hulme. The design of the new schools is Gothic in character, and in keeping with the architecture of the orphanage buildings. The elevations are of red stock brickwork, with stone dressings and terra-cotta strings and label moulds. The accommodation on the ground-floor consists of a large central schoolroom with a large classroom at each end, divided from the central school by movable partitions. These partitions, when raised, will form the three rooms into a large lecture-hall, 86 ft. long by 25 ft. wide, and capable of seating nearly 500 persons. There are separate entrances for the boys and girls at each end of the building, with stone staircases leading to the first floor. On the first floor is placed a large central schoolroom for the juniors, of the same size as the one below, and at each end are placed the chemical laboratory, with apparatus-room adjoining, for the boys on the one side; and a large sewing-room for the girls on the other. Ample cloak-room and lavatory accommodation is provided on both floors for the different schools, and private cloak-rooms for the teachers. There is also a storeroom for the school materials. The schools will accommodate about 460 scholars. The buildings have been erected by Messrs. R. Neill & Sons, contractors, of Manchester, from designs by and under the superintendence of Messrs. W. & G. Higginbottom, architects, St. James-square, Manchester. The schools have been erected in commemoration of the twenty-fifth anniversary of the foundation of the institution, and to meet its increasing requirements.

VARIORUM.

"The Practical Steam Engineer's Guide," by Emory Edwards (Sampson Low, Marston, & Co.), is addressed especially to the engineers, firemen, and steam-users of America, but will be found, we are inclined to think, a valuable guide and assistant to a similar class in this country. It includes a large number of illustrations, and is clearly printed.——The first article in the October number of the *Nineteenth Century* will interest many of our readers; it is on the "Financial Condition of Trade Unions," by Mr. George Howell, and should certainly invite criticism, it is so charmingly rose-coloured. He thinks the gross balances of all the Unions may be put down as being equal to one-third more than the gross annual income; this would give them, he says, a total available balance of cash in hand of about three millions sterling,—equivalent to eighteen months' contributions, fees, and fines.——The proprietors of the *Pictorial World* are making strenuous efforts to raise the character of this periodical, and are obviously succeeding. The first number of the new series, containing among other illustrations a portrait in colours of Sir Garnet Wolseley, is being reprinted as a special edition.—— "*Fun's* Academy Skits" (153, Fleet-street) is a good shilling's-worth, very funny, and not ill-natured. Although the Exhibition is closed, the little book of skits is still worth buying.——The "Metal Turner's Handbook," by Paul N. Hasluck (Crosby Lockwood, 1882) should be useful to some of the younger candidates for the prizes offered by the Turners' Company. It includes 100 illustrations, and costs but a shilling.

Miscellanea.

Presentation to a Builder.—A few evenings ago a numerous company supped together at the Russell Arms, Bedford-street, Ampthill-square, on the occasion of the making a presentation to Mr. Stephen Jakins, builder, of Fitzroy-court, Tottenham-court-road. Mr. C. Spence, Mr. Jakins's foreman presided, and amongst those present were most of the firm's *employés*, as well as several contractors and merchants. On the removal of the cloth, the chairman made a few remarks as to the character of the gathering, observing that they had met together to do honour to a very worthy man. Mr. Jakins was not one of those "jerry" builders who put up a building which was blown down soon afterwards. His structures would last for centuries. The tenants on the estate of the Marquis de Rothwell, in Camden Town, and for whom Mr. Jakins was the builder, had freely come forward with their contributions, and the Marquis and Marchioness, directly they heard of the proposal, had sent cheques. Mr. Jakins was a straightforward, honourable, and businesslike man, and he had the greatest pleasure in asking the company to drink his health. Mr. Jakins, in a few appropriate and earnest words, thanked the subscribers for their gift (a valuable musical box), and the company for their good wishes. The members of the committee, Messrs. Pilkington, Brown, Jackson, Heal, and Sherriff, each spoke and alluded to the merits of Mr. Jakins, both as a builder and as an employer of labour, and referred to the amicable spirit that had been maintained between him and his *employés*.

Northern Architectural Association—The annual meeting of this Association was held on the 3rd inst. in the Castle, Newcastle. The affairs of the Association were shown by the report read to be in a satisfactory condition. Mr. J. Tilman, F.R.I.B.A., of Sunderland, who presided, was re-elected president, and other officers were chosen for the next twelve months.

The Turners' Company.—The prizes awarded by this company were presented at the Mansion House on Thursday morning last. The exhibition included a considerable number of articles. Among the exhibits in wood were thermometers, vases, epergnes, flower-stands, candelabra, paper-racks, picture-frames, fruit-stands, and egg-cups. The judges in this class were Colonel Sandeman, Mr. C. Hutton Gregory, C.M.G., Mr. J. J. Holtzapffel, and Mr. Josolyne, and they awarded the first prize, consisting of a silver medal and the freedom of the company, to Thomas Macdonald, of Chapel-house-street, Millwall, and the second prize, comprising a bronze medal and four volumes of "Holtzapffel's Turning and Mechanical Manipulation," to W. A. Barber, of 92, Cleveland-street, Fitzroy square. There were twenty other prize-winners, seven of whom were apprentices. The judges recognised a general improvement in the quality of the works sent in, both in design and execution. In stone, the judges considered the whole competition most satisfactory and useful. The first prize they awarded, for tazza and three plates, to William Banks, of 6, Henry-street, Battersea, and the second to John Thomas Stevens, of 21, Douglas-street, Vincent-square, for candelabra and candlesticks. In the precious stones class the principal prizes went to W. Gorsuch, Mr. Brown, Frederick Shambrook, and Edward Renton. We cannot quite endorse the appreciatory expressions of the judges. There was a considerable amount of good honest work, but the art displayed in many of the specimens was execrable.

Steven Brothers & Co.—The Milton Iron Works in Glasgow, with annexes in Upper Thames-street, London, is a very large establishment, and the newly-revised Illustrated Catalogue, just now issued (21st edition), is a large and expensive book to match. It is devoted more particularly to open and close fire kitchen-ranges, and will enable those who wish to make choice of such wares to do so with ease. One of Messrs. Steven Brothers' ranges ("123 in the book") obtained the first award at the Melbourne International Exhibition.

St. James's Church, Clerkenwell.—This parish church, which has undergone restoration, is about to be re-opened. Two large painted windows have been placed in the east end of the church, the gift of the "Crusaders'" Lodge of Freemasons, to commemorate the restoration; the subjects are "The Building of the Temple," and "The Queen of Sheba visiting the Temple on its completion." The Freemasons' and Crusaders' arms, numerous Masonic emblems, &c., are introduced. The windows are from the studio of Mr. Charles Evans, of Warwick-street.

Competition: Christmas Card Albums.—Messrs. Hildesheimer & Faulkner, publishers, are offering money for the best eighty albums, containing Christmas and New Year cards; and a further sum for certain fancy articles. It is a mere business advertisement, and they should take the ordinary means to make it known.

Herne Burial Board.—This Board advertised in August for competitive designs for a fence of oak, iron, or stone, and of a lych-gate, for Herne Churchyard. The premium was awarded on September 26 to Mr. Allan O. Collard, of the Metropolitan Board of Works Office.

Angell's Airtight Covers.—Mr. Angell, of 144, Fulham-road, has sent to the Exhibition of the Sanitary Congress in Newcastle specimens of his Airtight Manhole Covers, which are used at various points of the drainage in basements, so as to admit of examination, and are found to answer the purpose thoroughly well.

Stained Glass.—Another Munich window has just been placed in St. Alphege's Church, Blackfriars-road, representing Christ blessing little children. It is in memory of the wife of the Major-General Taylor, and has been designed and executed by Messrs. Mayer & Co.

Great International Fisheries Exhibition, 1883.—The construction of buildings for the Great International Fisheries Exhibition, 1883, has begun in the Royal Horticultural Society's Gardens, and considerable progress has already been made.

Burnley Borough Surveyorship—At a meeting of the Burnley Town Council on Wednesday afternoon, Mr. Stafford, of Liverpool, was appointed borough surveyor, at a salary of 250*l.* per annum.

"Dixon's New Metallic Gas." — The *Liverpool Daily Post* gives some particulars of a new illuminating gas, introduced by Mr. John Dixon, a gas engineer. Mr. Dixon claims for his invention the production of improved gas for illuminating purposes by the decomposition or dissolution of the component parts or constituents of metals, earths, acids, carbon, and hydro-carbon substances, the salts of alkalis, the dissolution of the substance being caused by heat. Certain chemical substances, when strongly heated, produce flames of peculiar colours, which, when blended, produce a white light, and, acting on this knowledge, the inventor claims to have realised what he says has been the dream of his life, and to have produced an apparatus capable of manufacturing and storing a gas the result of the decomposition of the afore-mentioned chemicals, so that now he is prepared to supply a gas which, he says, is not only superior to, but vastly cheaper than, any supplied by any other persons or companies in any part of the globe. The new gas can, it is stated, be made at about one-tenth of the cost of coal gas, and another merit claimed for it is that it can be burnt without vitiating the atmosphere of apartments to anything like the extent which results from the combustion of coal gas. Its luminosity, as tested with the photometer, is stated to compare very favourably with that of coal gas. A limited liability company has been formed to work the patent, and model works, capable of supplying gas for upwards of 1,000 ordinary burners, have been established in the Commercial-road, Liverpool.

What Co-operation can do. — A correspondent writes,—In 1847 the flour sold in Leeds by the millers of the neighbourhood was dear and bad, and the principal sufferers by this were the operatives of the district. A few of the most intelligent of their number got together and projected and started a co-operative mill. This proved a success, and, as years went on they added other articles to flour,—groceries, provisions, upholstery, tailoring, dressmaking, boot and shoe making, coal, &c. All these have been successful. I shall not trouble you with details or rate of progress; I desire simply to say that on last Saturday this society had 20,453 members, a capital invested by these members in business of 190,039*l.*, and a freehold and fixed stock in addition of 127,111*l.* Their business done during the last twelve months amounted to no less than 440,057*l.*; while in bonus and interest they paid to their members no less than 45,523*l.* during the same twelve months. This is one society, and there are in the country about 1,200 of them, though this is numerically the largest. I may add, that since 1844, when the first co-operative store was opened, 24 millions sterling have been divided among these working men in bonus and interest. There are nine millions sterling invested in business, and at the present moment two millions sterling per annum are divided among the working men composing these associations.

TENDERS

For new shop, and alterations to the Royal Oak Inn, Fenton, for Messrs. Keeling & Wright. Messrs. Keates & Bradford, Miles Bank-chambers, Hanley, architects. Quantities by the architects :—

Bradney & Co., Wolverhampton	£1,420 0 0
J. Gallimore, Newcastle, Staffordshire	1,330 0 0
J. T. Clarke, Hanley	1,276 0 0
Hancock & Tipping, Fenton	1,270 0 0
W. Collis, Longton	1,100 0 0
T. Minks, Fenton	1,095 0 0
C. Cornes, Hanley	1,085 0 0
Wetton & Meakin, Fenton*	1,070 0 0

* Accepted.

For rebuilding the Market Tavern, Tontine-street, Hanley, for Messrs. Keeling & Wright. Messrs. Keates & Bradford, Miles Bank-chambers, Hanley, architects. Quantities by the architects :—

Bradney & Co., Wolverhampton	£2,270 0 0
J. Gallimore, Newcastle, Staffordshire	2,138 0 0
J. T. Clarke, Hanley	2,100 0 0
Meadon & Sons, Newcastle, Staffordshire	2,082 0 0
J. K. Tildesley, Hanley	2,055 0 0
G. Ellis, Hanley*	2,000 0 0
E. Gibson, Tunstall	1,995 0 0
C. Cornes, Hanley	1,799 0 0

* Accepted, subject to reductions.

For the enlargement of Albion-street Schools, for the School Board for London. Mr. E. R. Robson, architect :—

W. Shephard	£3,927 0 0
H. Hart	3,086 0 0
Kirk & Randall	3,019 10 0
S. J. Jerrard	2,983 0 0
W. Downs	2,939 0 0
T. Higgs	2,896 0 0
J. Oliver	2,893 0 0
B. E. Nightingale	2,881 0

For the supply of cast-iron water mains, to be cast vertically, for the Worthing Local Board of Health. Mr. Walter Horne, surveyor :—

	Per Ton. 8-inch.	6-inch.	4-inch.	3-inch.	Irregulars.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Messrs. Macfarlane, Strang, & Co.	5 9 0	5 9 0	5 9 0	5 9 0	10 0 0
The Tees Side Iron and Engine Works Co.	5 5 0	5 5 0	5 5 0	5 5 0	10 0 0
J. J. Robson	5 12 6	5 12 6	5 12 6	5 12 6	8 17 6
Cambrian Iron and Brass Foundry	5 4 0	5 4 0	5 4 0	5 4 0	8 4 0
Joseph Gould	5 2 6	5 2 6	5 5 0	5 7 6	8 17 6
Cochrane & Co.	5 2 6	5 2 6	5 5 0	5 5 0	8 15 0
J. S. Roberts	5 0 0	5 2 6	5 3 0	5 3 0	8 5 0
J. Harrison	5 0 0	5 0 0	5 2 0	5 4 0	8 5 0
Staveley Coal and Iron Co.	5 2 6	5 2 6	5 2 6	5 2 6	7 10 0
The Thames Bank Iron Co.	4 19 9	4 19 9	4 19 9	5 4 9	8 5 0
C. E. Firenstone Bros.	4 16 3	4 16 3	4 16 3	4 18 9	7 15 0
Stanton Ironworks Co. (accepted)	4 14 0	4 14 0	4 15 0	4 19 0	7 10 0

For taking up old water mains and re-laying with new pipes, for the Worthing Local Board of Health, at per ton :—

	8-inch.	6-inch.	4-inch.	3-inch.	Irrglrs.
	s. d.	s. d.	s. d.	s. d.	£. s. d.
J. Dibley	3 2	2 6	2 1	1 9	5 0 0
H.T. Horscroft	2 6	2 3	1 9	1 6	5 0 0
J. J. Robson	2 6	2 2	1 7	1 4	3 10 0
J. Harrison	2 2	1 9	1 4	1 0	2 0 0
Joseph Gould*	2 0	1 6	1 4	1 2	1 10 0

* Accepted.

For the forming of 18 in., 15 in., and 12 in. pipe sewer, in Brighton-road, Worthing, for the Worthing Local Board of Health. Mr. Walter Horne, surveyor :—

J. Dibley	£748 1 3
James Blaker	738 0 0
T. C. Kerridge	634 10 10
Woodham & Fry	612 10 0
J. J. Robson	601 6 3
J. Harrison	585 17 4
Joseph Gould (accepted)	533 13 6

For the erection of a girls' and infants' school at Castelnau, for the Barnes School Board. Mr. C. Innes, architect :—

G. Legford	£1,533 0 0
J. Longley	1,527 0 0
F. R. Tozer	1,512 0 0
W. Parkinson	1,475 0 0
W. H. Wheeler	1,465 0 0
A. Drew	1,420 0 0
W. T. Brockwell & Son	1,398 0 0
Eayres & Sampson	1,395 0 0
J. Anley	1,390 0 0
Jones & Co.	1,390 0 0
J. Tyerman	1,389 0 0
C. J. Bartlett	1,389 0 0
G. Torkington	1,382 0 0
S. Eyles	1,370 0 0
F. Higgs	1,364 0 0
W. Batstone	1,360 0 0
H. Hunt	1,350 0 0
G. Reavell	1,299 0 0
C. Wilson	1,289 0 0
Priestley & Gurney	1,280 0 0
J. Stayner	1,256 0 0
J. Bryant	1,250 0 0
W. Johnson	1,209 0 0
Dawson & Sons	1,199 0 0
A. Hunt	1,174 0 0
C. Collins	1,145 0 0

For the formation, curbing, channelling, and paving Anchor-place, Longton, for the Town Council. Mr. Arden Hardwicke, C.E., borough surveyor :—

C. Lloyd, Stoke-on-Trent	£227 0 0
W. T. Moss, Stafford	199 19 10
J. H. Hawley, Longton	197 2 0
James Boughey, Stoke-on-Trent	195 10 0
John Mackey, Stoke-on-Trent	191 8 0
James Thorn, Longton (accepted)	183 8 5

For the formation, curbing, channelling, and paving Gladstone-street, Longton, for the Town Council. Mr. Arden Hardwicke, borough surveyor :—

C. Lloyd, Stoke-on-Trent	£261 12 6
W. T. Moss, Stafford	220 0 2
J. H. Hawley, Longton	213 0 0
John Mackey, Stoke-on-Trent	209 14 0
James Thorn, Longton (accepted)	203 11 3
James Boughey, Stoke-on-Trent	199 5 0

For building eight houses at Aldrington, Brighton, for Major J. Childs. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove :—

Lockyer, Brighton	£19,961 0 0
Oliver, Brighton	18,500 0 0
Goddard & Sons, Farnham	17,486 0 0
Tyerman, London	17,095 0 0
Perry & Co., London	16,956 0 0
Scrivener & Co., London	16,782 0 0
Reynolds, Brighton	16,749 0 0
Nightingale, London	16,482 0 0
Chappell, London	16,256 0 0
Adcock, Dover	16,140 0 0
Humphrey & Sons, Brighton	15,850 0 0
Holliday & Greenwood, London	15,777 0 0
Martin, Wells, & Co., Aldershot	15,639 0 0
Green, London	15,639 0 0
Barnes, Brighton	15,200 0 0
Stimpson & Co., London (accepted)	14,600 0 0

For sundry works in erecting new wing and making certain alterations and additions to the premises, No. 6, Gloucester-road, Regent's Park, for Mr. Robert Borwick, Messrs. C. Eales & Son, architects :—

Scrivener & Co.	£1,299 0 0
Mark	1,257 0 0
Drew	1,199 0 0
Shaw	1,198 0 0
Harradine	1,195 0 0
Pritchard	1,156 0 0
Goode Bros.	1,112 18 0
Taylor & Parfitt (accepted)	1,019 0 0

For the erection of five houses in the Hastings-road, Ealing Dean. Mr. Robert Willey, 66, Ludgate-hill, architect :—

Stops, Ealing (accepted)	£1,050 0 0

For drainage, for the Brentford Local Board. Messrs. Gotto & Beesley, engineers, 17B, Great George-street, Westminster :—

Contract No. 2.—Cast-iron Pipes.

J. Hayward, Eastbourne	£5,681 9 0
Macfarlane & Co., Glasgow	5,673 11 10
Thos. Edington & Son, Glasgow	5,413 16 1
Thos. Spittle, Newport	4,897 14 0
Tees-side Iron Co., Middlesbrough	4,762 3 5
The Butterley Co., Alfreton	4,677 3 8
Firmston Bros., Stourbridge	4,423 14 7
Cochrane & Co., Dudley	4,392 12 4
J. & S. Roberts, West Bromwich	4,278 7 9
Stanton Iron Works, Nottingham	4,258 19 11
Kellett & Bentley, 4, Queen Victoria-street	4,234 10 8
Jas. Oakes & Co., 21, Wharf-road	4,151 7 8
Cochrane, Groves, & Co., Middlesbrough	4,141 5 3
The Staveley Coal and Iron Co.*	4,052 5 6

* Accepted.

Contract No. 3.—Steam-engines, &c.

D. Howarth & Co., Rochdale	£4,338 0 0
C. Powis & Co., Gracechurch-street	4,175 0 0
J. Rowan & Son, Belfast	4,150 0 0
J. Clayton, Preston	3,975 0 0
Vernon & Ewins, Westminster-chambers	3,968 0 0
Pollock & McNab, Manchester	3,800 0 0
Gimson & Co., Leicester	3,550 0 0
J. Warner & Son, Cripplegate	3,400 0 0
John Esson, Fetter-lane	3,350 0 0
Western & Co., Derby	3,090 0 0
Tangyes (Limited), Birmingham	3,070 0 0
W. & J. Yates, Blackburn (too late)	2,980 0 0
Jas. Watt & Co., Soho (accepted)	2,600 0 0

Contract No. 4.—Buildings and Sewers.

W. J. Botterill, 110, Cannon-street	£26,405 0 0
F. Nowell, Shepherd's-bush	22,500 0 0
G. Law, Kidderminster	21,584 0 0
Jos. Mears, Hammersmith	20,150 0 0
McKenzie, Williams, & Co.	20,072 0 0
Nowell & Robson, Kensington	19,760 0 0
J. G. Marshall, Brighton	19,630 0 0
J. Hayward, Eastbourne	19,447 0 0
G. G. Rayner, Bootle	17,500 0 0
Kellett & Bentley, Queen Victoria-street	17,466 0 0
Jas. Dickson, St. Alban's	17,034 0 0
Jas. Dooley, Tottenham	15,058 0 0
Ford & Everett, Westminster*	14,500 0 0

* Accepted.

For additions and alterations to premises, No. 212, Westminster Bridge-road, for Messrs. Atkinson & Co. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode :—

Higgs & Hill	£1,834 0 0
Niblett	1,829 0 0
Hook	1,800 0 0
Lathey Bros.	1,730 0 0
Ansell	1,634 0 0
Nightingale	1,616 0 0
Lapthorne & Co.	1,599 0 0
Holliday & Greenwood	1,550 0 0

For alterations to the Britannia public-house, Mare-street, Hackney, for Mr. White. Messrs. Williams & Sons, architects :—

Smith	£155 0 0
Wood	119 0 0
Marr (accepted)	109 0 0

For alterations to the Crown public-house, Grove-road, Hammersmith, for Mr. W. H. Johnson :—

Chamberlain Bros.	£789 0 0
Anley	714 0 0
Marr (accepted)	692 0 0

For the entire re-decoration of the Metropolitan Music-hall, Edgware-road, for Mr. Lake :—

F. Mark	£780 0 0
Maple & Co.	697 10 0
Silani	420 0 0
Rosenburg	412 0 0
Battam & Haywood	410 0 0
E. Bell	380 0 0

For works at the Old England Tavern, for Mr. G. W. Wakley. Messrs. Perry & Seamen, architects :—

Adams	£1,045 0 0
Stimpson & Co.	893 0 0
Beale	865 0 0
Jackson & Todd	745 0 0

For detached villa residence, Altrincham, for Mr. Wm. Allwood, exclusive of fittings and boundary-walls. Mr. Wm. Owen, Manchester, architect :—

Hy. Ormson, Bowden	£589 0 0
Jas. Hamilton, Bowden	586 0 0
J. Pennington, Bowden	568 0 0
Martin Stone, Altrincham (accepted)	580 0 0

For new club-house for the South Hampstead Working Men's Club, Fleet-road, Hampstead. Mr. Frederic A. Gosling, architect, 148, Hampstead-road. Quantities supplied:—

Groome	£2,175	0	0!
Allen & Son	1,700	0	0
Blandford & Co.	1,589	0	0
Miller	1,564	0	0
Newton	1,535	0	0
Crabb	1,455	0	0
Angood	1,420	0	0
Killby	1,414	0	0
Allard	1,400	0	0
Jones & Co.	1,389	0	0
Carpenter & Poole	1,385	0	0
Martin & Goddard	1,380	0	0
Niblett	1,375	0	0
Richardson Bros.	1,365	0	0
Scott	1,347	0	0
Treweeke & Co.	1,337	0	0
Parker	1,297	0	0
Aldridge & Jenvey	1,184	14	0
Garrud (accepted)	1,183	0	0!

For schools, Cook's Ground, Chelsea, for the School Board for London. Mr. E. R. Robson, architect:—

J. T. Chappell	£8,350	0	0
C. Wall	8,195	0	0
J. Marsland	8,127	0	0
J. Grover	7,988	0	0
W. Shurmur	7,983	0	0
Higgs & Hill	7,938	0	0
Stimpson & Co.	7,712	0	0
W. Oldrey	7,700	0	0

For schools, Gloucester-grove East, Chelsea, for the School Board for London. Mr. E. R. Robson, architect:—

J. T. Chappell	£2,190	0	0
J. Marsland	2,180	0	0
W. Oldrey	2,134	0	0
Higgs & Hill	2,114	0	0
C. Wall	2,098	0	0
J. Grover	1,988	0	0
W. Shurmur	1,980	0	0
Stimpson & Co.	1,888	0	0

For residence, New Malden, Surrey, for Mr. C. Derry. Mr. W. D. Church, architect, 12, South-place, Finsbury. Quantities by Messrs. Osborne & Russell:—

Aviss & Co.	£2,725	0	0
Woodward	2,656	0	0
Dove Bros.	2,650	0	0
Sabey	2,599	0	0
Gibbs & Flew	2,538	0	0
Killby	2,480	0	0
Taylor & Parfitt	2,475	0	0
Stimpson & Co.	2,425	0	0
Hearle & Son	2,381	0	0
Shurmur (accepted)	2,349	0	0

For works at Kent County Lunatic Asylum, Chartham Downs. Mr. Frederick W. Ruck, county surveyor:—

Contract No. 1.—Extension of Day-room.

Harris & Son, Tunbridge Wells	£1,144	0	0
J. Wood & Co., Peckham	1,029	0	0
William Brooks, Folkestone	885	0	0
J. J. Wise, Deal	821	0	0
G. H. Denne, Deal	785	0	0
Wallis & Clements, Maidstone	763	0	0
Paramor & Son, Margate	760	0	0
W. & T. Denne, Walmer, Kent	725	0	0
A. N. Pryer & Co., Maidstone	729	0	0
Hayward & Paramor, Folkestone	709	0	0
John Shurmur, Kingsland	660	0	0
R. Hatton, Sturry, Kent (accepted)	651	0	0
B. Pitt, Upper Eastville, near Bristol	568	0	0

Contract No. 2.—Additions to Sanitary Block (Men's), Wards 3 and 4.

William Brooks, Folkestone	£635	0	0
J. J. Wise, Deal	558	0	0
J. Wood & Co., Peckham	539	0	0
G. H. Denne, Deal	530	0	0
Wallis & Clements, Maidstone	530	0	0
W. & T. Denne, Walmer, Kent	500	0	0
Paramor & Son, Margate	491	0	0
A. N. Pryer & Co., Maidstone	489	0	0
Harris & Son, Tunbridge Wells	484	0	0
Hayward & Paramor, Folkestone	465	0	0
R. Hatton, Sturry, Kent (accepted)	460	0	0
John Shurmur, Kingsland	440	0	0
B. Pitt, Upper Eastville, near Bristol	390	0	0

For alterations and additions to Lambeth Workhouse, Lower Kennington-lane. Messrs. Wilson, Son, & Aldwinckle, architects:—

W. Shurmur (accepted).

For the erection of a pair of houses in Melville-street, Ryde. Mr. R. J. Cornewall Jones, architect. Quantities supplied:—

W. Ward, Portsmouth	£2,453	0	0
T. Saunders, Ryde	2,453	0	0
Salter, Ryde	2,430	0	0
Jenkins Bros., Ryde	2,365	0	0
Jolliffe, Sandown	2,339	0	0
Hutchings, Binstead	2,285	0	0
Meader, Ryde	2,140	0	0
Sibley, Ryde	2,095	0	0
E. James, Binstead (accepted)	1,915	0	0

For alterations and additions to the Kensington Workhouse and Infirmary, for the Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—

Cowland & Co.	£2,550	0	0
Crockett	2,297	0	0
Nightingale, Albert Embankment*	1,887	0	0

* Accepted.

Sanitary Fittings and Engineering Work.

Clark, Bunnett, & Co.	£2,500	11	0
Chadwick	1,965	0	0
Jeakes & Co.	1,884	6	0
Nightingale	1,668	0	0
Stidder & Co.	1,562	0	0
G. Crapper	1,445	0	0
May Bros. Holborn (accepted)	1,280	0	0

For alterations and additions to house, Maida Vale. Mr. C. H. Thomas, architect. Quantities by Messrs. J. & A. E. Bull:—

Nunn	£1,946	0	0
Oldrey	1,857	0	0
Hook	1,660	0	0

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